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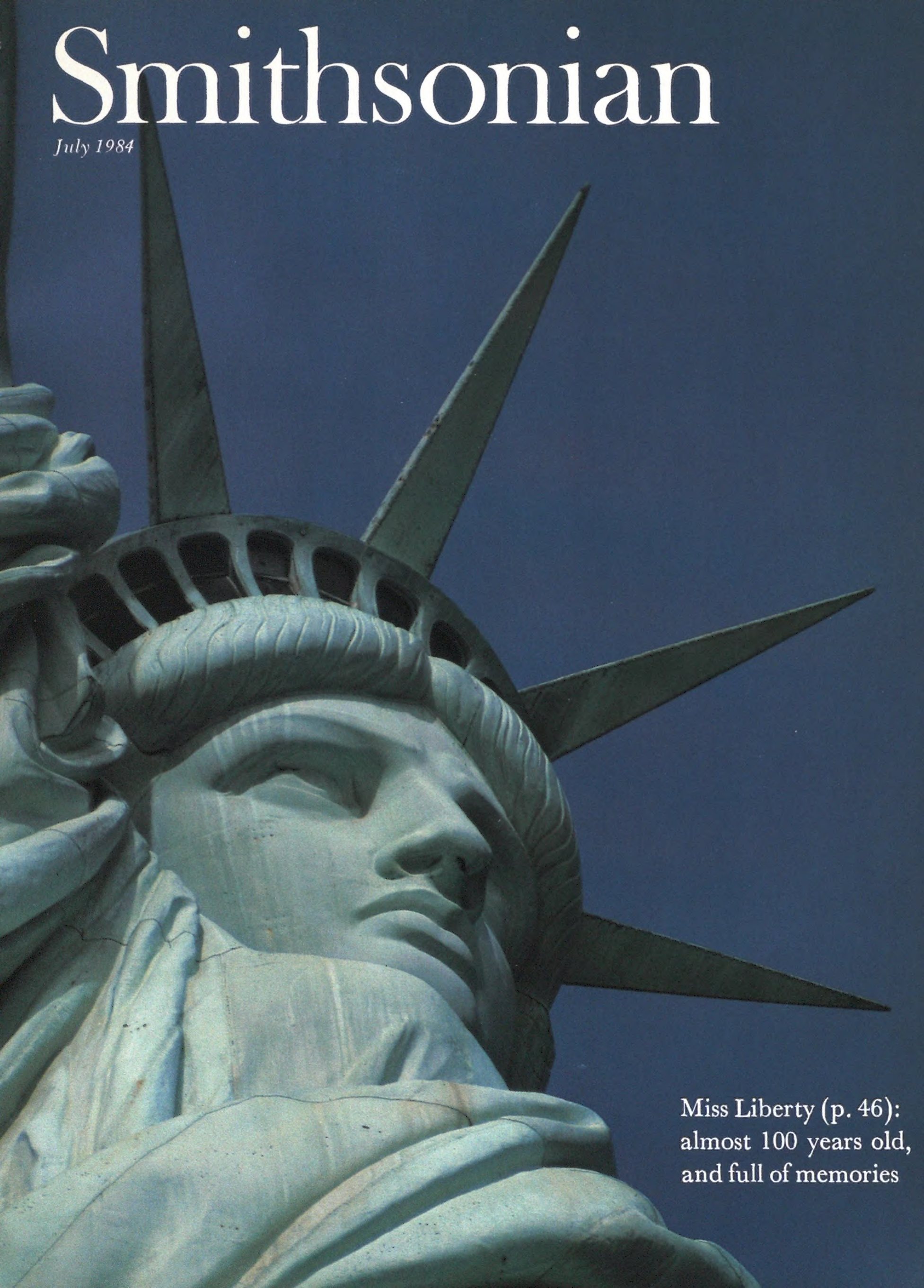

Miss Liberty (p. 46):
almost 100 years old,
and full of memories

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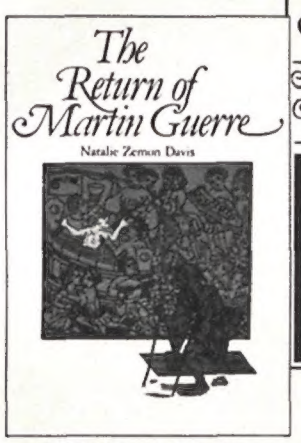

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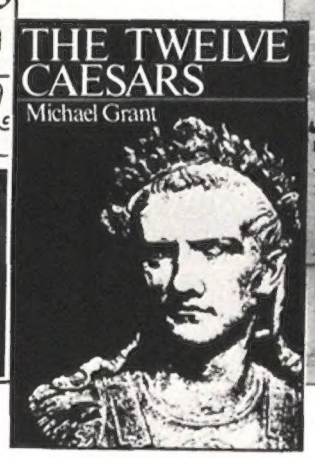

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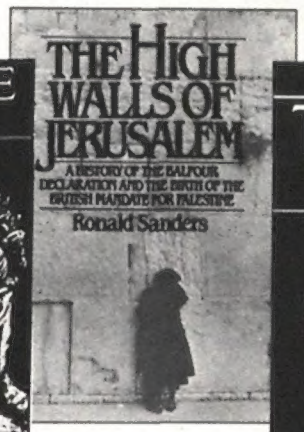
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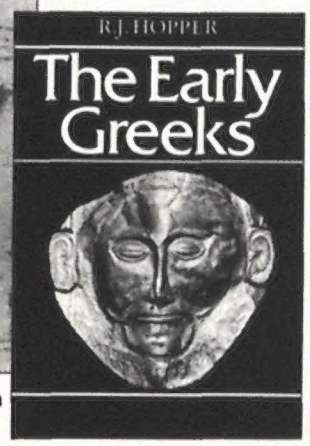

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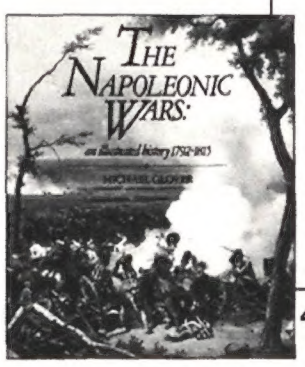

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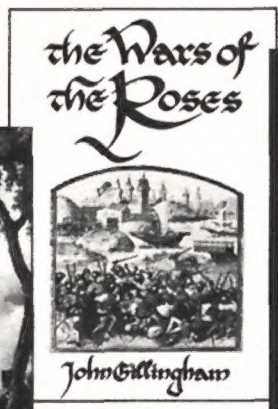

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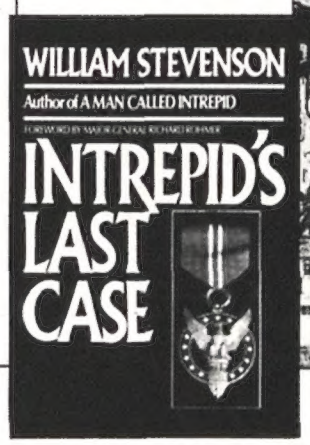

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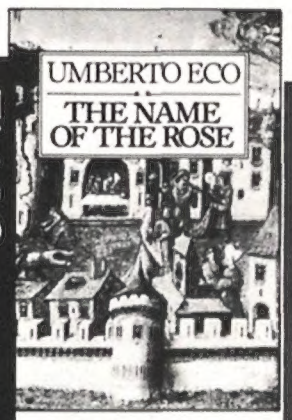

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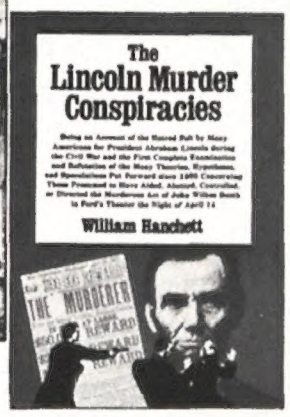

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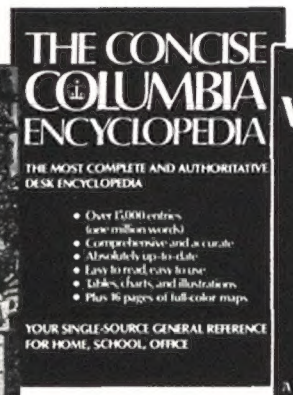
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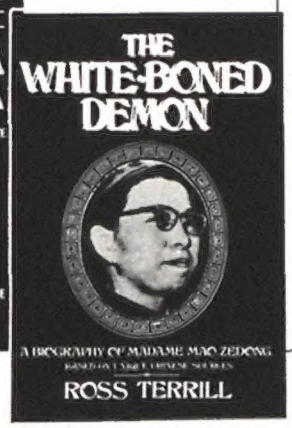

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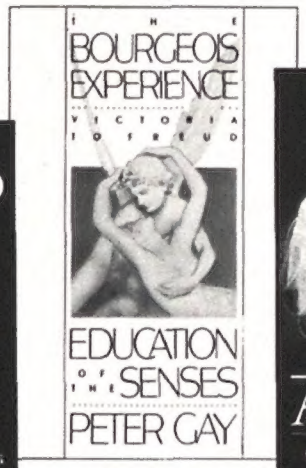

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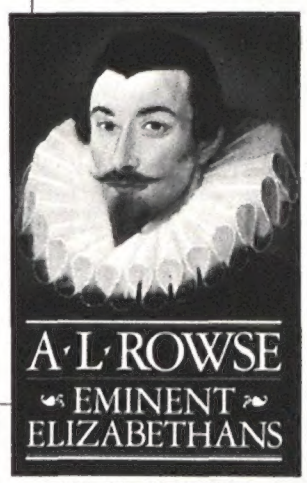

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July 1984

Smithsonian

Volume 15, Number 4

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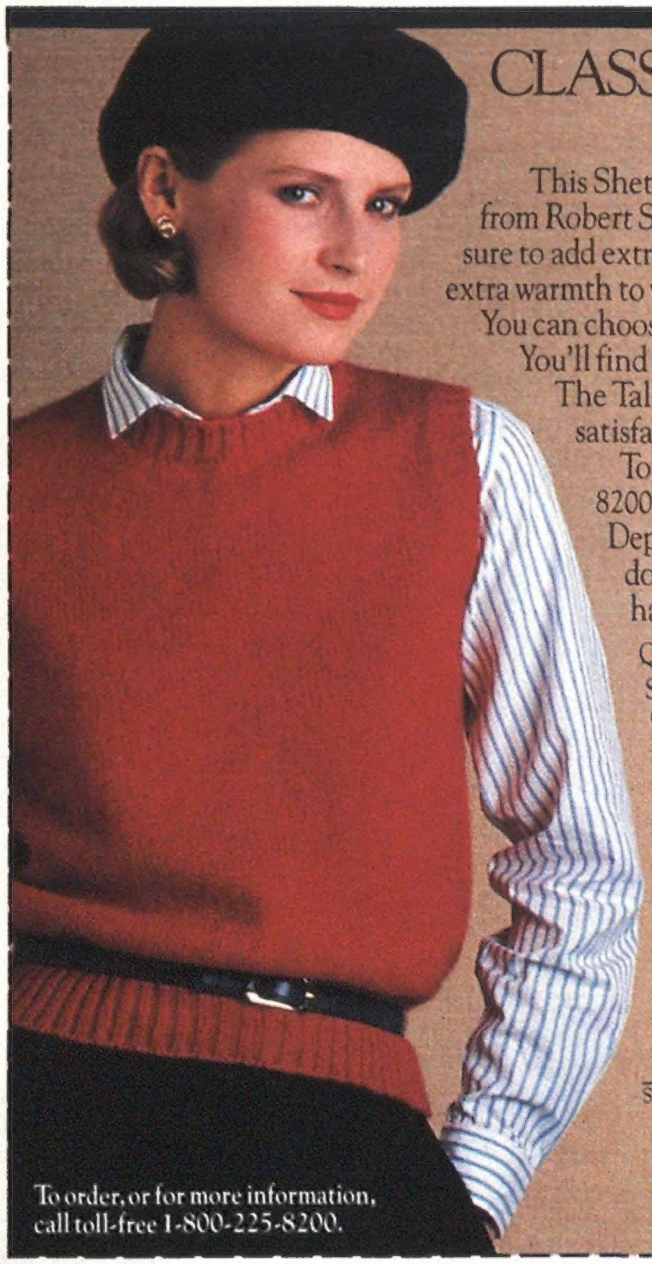

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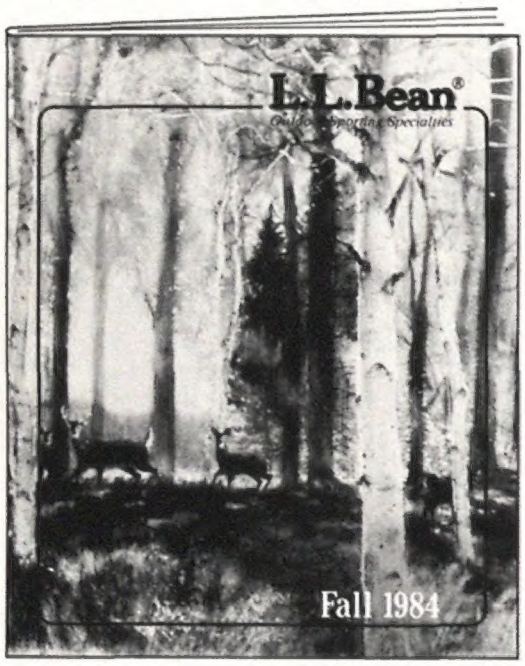

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The view from the castle

Opened 15 years ago, the National Portrait Gallery since then has become one of the foremost collections of its kind in the world

In the summer of 1963 I remember being asked by the late John Nicholas Brown, a Regent of the Smithsonian, to join with our mutual friend, Wilmarth S. Lewis, the great Walpole scholar and historian of 18th-century England, to devise a format for a new Smithsonian entity. Created by Congressional statute in 1962, the new National Portrait Gallery was to come into existence as a bureau of the Institution.

It was one thing for my distinguished predecessor, Dr. Leonard Carmichael, to have presided over saving the great U.S. Patent Office building from demolition and transformation into a parking lot. It would be another to obtain the necessary funds to restore the classic edifice, built more than 100 years before.

But Messrs. Brown and Lewis realized that much more was at stake than just "bricks and mortar." Despite years of wishing, up until that time the Smithsonian had never been able to create a national gallery of likenesses of people who had made America what it is. Over the years the Institution had acquired some portraits, largely by gift, but not in any systematic way and not with any repository in mind.

And so we started to plan a National Portrait Gallery; four years later, in October 1968, it opened with a new director, Charles Nagel, who had overseen restoration of the building with an architect's eye. A resounding start, but perhaps too late. As Nagel wrote, "A great many portraits, particularly of the Founding Fathers, have found their way to the walls of other institutions and are not available to us."

Today, however, our almost inevitable skepticism has vanished. The Gallery, through the dogged initiative of its subsequent directors, Marvin Sadik and Alan Fern, has succeeded in making a great name for itself. Such acquisitions as the "Edgehill" portrait of Thomas Jefferson by Gilbert Stuart (owned jointly with Monticello—see page 69); the magnificent plaster self-portrait by John Frazee; the watercolor of Benjamin Franklin in France by Carmontelle (bequeathed to us by Mrs. Herbert Hoover); and the recently purchased portrait of the American painter Mary Cassatt by her friend Edgar Degas—all these show notable growth.

Among photographs there are the extraordinary collection of plates by Mathew Brady and his studio, assembled by Frederick Hill Meserve, and individual portraits by Alfred Stieglitz, Paul Strand and Edward Steichen. Nor are the holdings limited to images of Presidents and the work of major artists; the files of the Pinkerton Agency yielded portraits of Butch Cassidy and the Sundance Gang; other recent acquisitions range from composer W. C. Handy to economist and social critic Thorstein Veblen.

In addition, publications abound. The most recent is the first volume of *The Selected Papers of Charles Willson Peale and His Family*, edited at the Gallery by Lillian B. Miller and her staff and published by Yale University Press.

There are four other great portrait galleries—in London, Dublin, Edinburgh and at Versailles. Truly, we are in good company. The ambitions of the Regents and Secretary Carmichael have been fulfilled. This country is now secure in having a great National Portrait Gallery of its own. We can all be proud.

S. Dillon Ripley

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S7

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Letters to the Editor

D Day remembered

Dear Sir: Your pictures with the Tom Wolf story were great, but where was "Lucky" *Herndon* herself? Your readers may be interested in the action picture taken during gunnery practice with the five-inch, 38-caliber battery trained out to port. *Herndon* is wearing the North Atlantic "dazzle" paint she wore at Normandy. This was the standard camouflage for World War II escorts in the North Atlantic. One objective of this pattern was to make the ship look very small from a submarine periscope—too small to waste a torpedo on. We didn't fool one submarine off Gibraltar, but, fortunately, her torpedo passed directly under us, too deep to do any damage—Lucky *Herndon*!
Captain Bernard W. Moulton, USN (ret.)
Annapolis, Maryland

Dear Sir: The Navy Department is presenting an exhibition of original D Day art in the Great Hall of the National Academy of Sciences from June 6 to September 6. Sketched during the invasion and later painted by famous combat artists Jamieson, Shepler and Russo, these paintings have never before been seen by the public.
Donald C. Morency
Washington, D.C.

Dear Sir: On page 140 you show a photo of "exhausted infantrymen of the U.S. 16th Division struggling past floating wreckage and knocked-out vehicles to the beaches." I am sure you meant to identify this unit as the 16th Regiment. There was no 16th Division in the U.S. Army during World War II—at least not in Europe. There was a 16th Armored Division, but they were not involved in D Day.
Lt. Col. Albert T. Willis jr., USA (ret.)
New Bern, North Carolina

Phenomena

Dear Sir: Now you have really done it. Not only do I have to worry about shark attack à la *Jaws* of Hollywood and the

USS *Herndon* (DD 638) in North Atlantic

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gators of Gainesville, but you're telling me that we are going to be having *more* saltwater crocodiles—that pollution, dilution, infusion, contusion, intrusion, exclusion have not wiped out those ugly beasts yet. Bless you for the good news.
Georgia A. Bicknell
Merritt Island, Florida

Dallas Museum

Dear Sir: Helen Dudar captures beautifully the sense of celebration we all have, but the story is not complete without a mention of Jerry Bywaters, painter, critic, teacher and historian, whose 23 years of stewardship as director of the Dallas Museum brought it to the point from which Merrill Rueppel could make the preparations and Harry Parker could make the move. It detracts nothing from the achievements of either to make that point, and I feel both men would hasten to say so.

Bywaters was an early leader in opening this city to the acceptance of work by living artists. He nearly got run out of town in 1947 for hanging an exhibit of the early works of Hans Hofmann. His leadership, and that of the Dallas Museum of Contemporary Arts, are two reasons why our new museum's great vault and galleries are filled with contemporary art—and why the museum is filled with people who truly enjoy it.
Patsy Swank
Dallas

Heraldry

Dear Sir: Since reading your story I have run across an odd thing which may be of interest. In the tale of the Red Hand of Ulster, O'Neill chopped off and threw his left hand to the shore. In the current blazons of the various O'Neill arms, the sinister hand is specified in some but the dexter hand in others, while the arms of the Province of Ulster call for a dexter hand (source: Burke's *General Armory*).

At the risk of offending my Irish ancestors I must say the Irish still don't know one hand from the other.
A. L. Dade
Media, Pennsylvania

Dear Sir: In Michael Olmert's article, please forgive me for pointing out one small slip: the "slip" in John Islip's rebus is not "a man falling out of a tree." The

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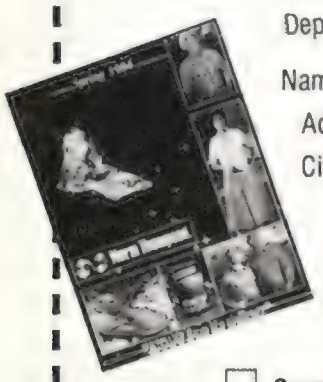

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arborist in the stained-glass tree in the Islip Chantry Chapel in Westminster Abbey is holding on very firmly with his left hand and is in no apparent danger of slipping. As every good gardener will recognize, he holds the slip in his right hand —a cutting "slipped" from the tree with a good heel to help it take root.
John C. MacGregor IV
South Pasadena, California

Dear Sir: Interesting that Paul McCartney of the Beatles was put on the Queen's honors list as a Member of the Most Excellent Order of the British Empire for his economic value. He was, as you note, thus entitled to be addressed as "Esquire." You failed to mention (as my 17th-century book on heraldry recites) that Paul Esquire now has the extraordinary privilege, if convicted of a capital offense, of electing to be beheaded instead of being hung like a commoner. Quite a privilege.
William T. Stevens
Charlottesville, Virginia

Cognitive mapmaking

Dear Sir: The article about Reginald Golledge brought to mind my brother, who lost his sight at 21. He became a designer and builder in California and built many homes and churches. He would often go from Escondido to Los Angeles to enter bids on contracts.

Once he asked me to drive him to Los Angeles to enter a bid. I was not familiar with the area, but he said "I will show you the way." He directed me to the proper freeway, then later, when we came to a certain corner, he told me the building that was there or the filling station, or something to identify the turn.

I was amazed—and we arrived in busy downtown Los Angeles without a hitch! It was the same going back home.
B. Holly Higgins
Ashland, Oregon

Dear Sir: I read with a great deal of interest about Dr. Golledge's research. To suggest that this study is of recent origin, however, does disservice to the continuity Golledge's work represents and to the memory of a great teacher. Kevin Lynch of MIT began his studies of "imageability" in the urban environment more than 30 years ago. His pioneering book, *The Image of the City* (MIT Press), was published in 1960 and contained both the

HOW TO WEAR A SEAT BELT

YOU CAN BE BOTH SECURE AND COMFORTABLE IN YOUR CAR.

It's been proved over and over that seat belts at least double your chances of escaping death or serious injury in a severe accident.

But the freedom of movement allowed by the newer front seat belts has bothered some people. How can the seat belt hold you securely if it appears to have almost no tension?

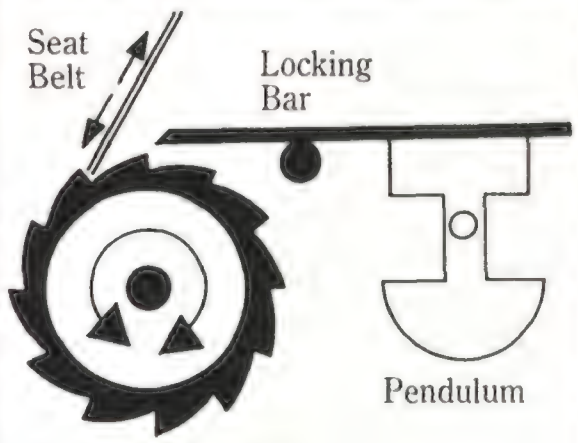
The fact is, the shoulder belt is designed to restrict your movement only in an emergency. In normal situations, you can lean forward or to the side with little pressure from the shoulder belt.

In an emergency, the belts lock up to hold you in place. The inertial reel makes this possible. That's a mechanism as simple and reliable as gravity (as you can see in the accompanying diagram). Inertial reels have been used since the 1974 model year for the shoulder belt in many GM cars. They allow you complete freedom of movement in normal driving. You can turn easily to check traffic or reach to the glove compartment.

Adjusting your shoulder and lap belt. Even the slight tension you feel from the inertial reel is adjustable so there is almost no pressure. Pull the shoulder belt far enough away from you so that, when you let it go, it comes back flat against your chest. Then pull down slightly on the shoulder portion, about one inch, and let it go again.

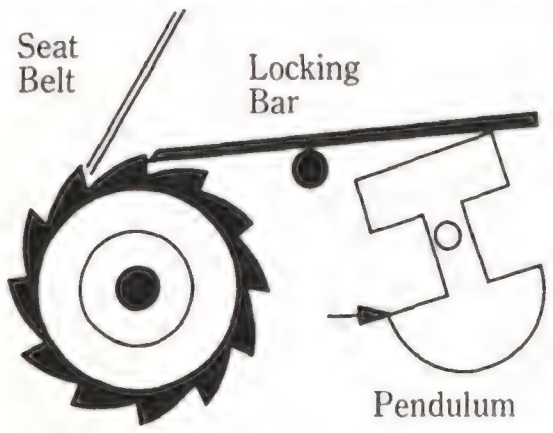
Safety experts suggest allowing no more slack on the shoulder belt than absolutely necessary for comfort. Lap belts should be adjusted snugly as low on your hipbones as possible—not higher where they might damage internal organs in a crash.

How the inertial reel works. *Your shoulder belt is designed to allow freedom under normal conditions, but to lock automatically and restrain you in a collision.*



Ratchet Mechanism

Under normal conditions, *the pendulum and locking bar are in their rest positions. The reel which holds the seat belt is free to rotate. As you lean against it, the belt unreels.*



Ratchet Mechanism

In emergencies, *such as a collision from any direction, the pendulum tilts, forcing the locking bar to engage the ratchet. The reel locks and the seat belt restrains you.*

In a collision, lap/shoulder belts, worn properly, distribute the force across the large, strong bones of your hips and torso. Perhaps most important, belts help keep you from being thrown out of the vehicle in an accident.

What if you are pregnant? The American Association for Automotive Medicine says the dangers of being unbelted in a collision during pregnancy are far greater than the slight chance of injury caused by wearing the belts.

Other advantages of belts. By holding you in a proper driving position, the lap belt provides a feeling of control, keeping you in place on rough or curved roads or in an emergency maneuver. Some people even find that the added support makes driving easier on their backs.

Next time you drive, please take a moment to buckle up. Remember, the seat belt is an effective system to help protect you, and it's already part of your car. Why not think of it as your "Life Belt" and use it.

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results of his research and the graphic-notation system he developed.

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Malcolm D. Rivkin
Washington, D.C.

Avery Island

Dear Sir: I was pleased to see that in your article on Avery Island, the diminutive black woman asks the foreman to record her name for the bonus, after missing out the day before. "Give it to me for lagniappe," she says good-naturedly, and he does. Mark Twain explains what this means in *Life on the Mississippi.*

"We picked up one excellent word—a word worth traveling to New Orleans to get; a nice, limber, expressive, handy word—'Lagniappe.' They pronounce it lanny-*yap*. It is Spanish . . . the equivalent of the thirteenth roll in a baker's dozen." It's nice to see lagniappe is alive and well after a hundred years.
Dean Gray
Waxahachie, Texas

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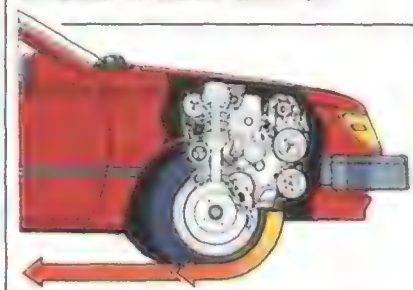

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Around the Mall and beyond

As you enter the front door of the castle and look to your left, you see the crypt that contains the bones of James Smithson. Flanking it is a beautiful and precious object that symbolizes the "knowledge, freedom and progress" of the Institution. It is the Smithsonian mace, a three-and-a-half-foot staff topped by a cagelike globe and a heraldic lion holding a sun. It all looks intensely meaningful. But *what* does it mean? A reader has asked me that question, and I have been finding out, as best I can.

I have found heraldry more complicated to negotiate than to read about in the May issue, but I've learned that a mace is a traditional symbol of authority and power now used primarily by cities, universities and public institutions. Since it started out as a war club, used for smashing armor, it retains a violent connotation: the "annihilation of assertive tendencies." In other words, it tells you that "if you get in the way of the good things I am doing, I will bash your head in." The Smithsonian has little inclination to bash assertive tendencies, but as an institution, it rates a mace.

Ours was planned for the 1965 bicentennial of James Smithson's birth. A Yale professor (Yale has a dandy mace) was delegated to draw up some heraldic ideas. These were sent to England and turned into the present design by Leslie Durbin, a famed craftsman of the "Worshipful Company of Goldsmiths" in London.

It took Mr. Durbin a year to finish the job, at a cost of $4,200, contributed by private donors. That's not a bad price, they tell me, for a mace these days. Durbin's masterpiece appeared on time and has been paraded on subsequent occasions.

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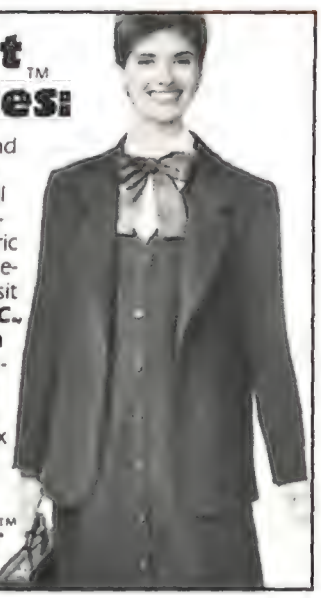

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1. Exceptionally well finished, this handsome oak file does more than look good. It has full-extension ball bearing glides in each drawer, rated to hold 100 lbs..

2. Tongue-in-groove joints and solid brass hardware are two examples of the fine quality built into this ice chest reproduction.

3. Far right: Inviting glow from this beautiful, brass banker's lamp adds a warm touch of the past to any room. Like the original, the green glass shade is hand-blown.

4. You've seen this classic set before—for much, much more. And remember, these ducks heads are *solid* brass, not just plated.

To describe the Smithsonian mace, I shall paraphrase a remarkable, detailed treatise by Walter Angst, the Smithsonian's own expert on the arcane subject of heraldry (SMITHSONIAN, July 1973). Starting at the top, a "demi-lion" (in other words, the top half of a lion) "rampant" (standing on left hind leg) and "gardant" (looking over its shoulder at the onlooker) is holding a gold sun. This small silver sculpture with ruby eyes and a gold tail rises from a "nest" with a blue bottom —smithsonite, the mineral that James Smithson identified. The lion comes from the Smithson family coat of arms and the wavy lines beneath it are Mr. Durbin's way of expressing James Smithson's illegitimacy.

To my eye, the most interesting part of the mace comes next—six gilded shields of places connected with Smithson's life (right). The shield for the city of Bath, where he grew up after his birth in France, has a crenellated wall, indicating that it was a Roman camp, and wavy lines to recall the hot springs that made it famous. The shield for Pembroke College, Oxford University, where Smithson was educated, is the coat of arms of the Herbert family, the Earls of Pembroke. It has three lions rampant and above them a rose for England and a thistle for Scotland.

A St. George's cross, with St. Paul's upright sword in the "first quarter," is the shield of London, where Smithson was a Fellow of the Royal Society. Paris, where he lived extensively, is designated by the ship and the fleurs-de-lis, a reminder that Paris was once a fishing village and a symbol of its importance as a river port. The other, simple, St. George's cross is the shield of Genoa, where Smithson died.

Finally, there is the coat of arms of Washington, D.C., where Smithson's institution thrives. It's actually the Washington family arms with bars and three "mullets," which means stars, not fish.

Below them is a golden astrolabe with a gold band circling it. This carries the key words from Smithson's will: "For the Increase and Diffusion of Knowledge Among Men." Inside this open orb are the "red-gilt" silver flames of a torch which was the original symbol of the Institution. Durbin felt that the sun was a better symbol because its effects are worldwide. So he played down the torch and emphasized the sun. No one seems to have quibbled. I guess when a Worshipful Goldsmith makes a suggestion, you take it pretty seriously.

Silver seals adorn Smithsonian mace, each a heraldic nod toward places connected with James Smithson's life. Clockwise from upper left: London, where he was a scientist; Pembroke College, Oxford; Genoa, where he died; Paris; Washington, D.C.; and Bath, where he grew up.

The staff of the mace has two more gold ribbons encircling it, inscribed with the names and terms of the Smithsonian Secretaries. Its base flares into a bell bottom with another chunk of smithsonite, highly polished. The whole business, staff and adornments, weighs about 11½ pounds and all the precious metals and gems came from the Smithsonian. Most originated in an 1840 gift from an Arabian ruler, which was stolen, largely melted down—and then recovered. Using it in the Smithsonian mace certainly seems the best way to restore it to the American people. Every day hordes of them gaze at this beautiful and magnificent treasure.

Some years ago I was fortunate enough to be included on a Smithsonian charter tour aboard the great four-masted bark *Sea Cloud*. I loved every minute, of course, and have since followed the peregrinations of my old ship as though she had actually belonged to me instead of Marjorie Merriweather Post.

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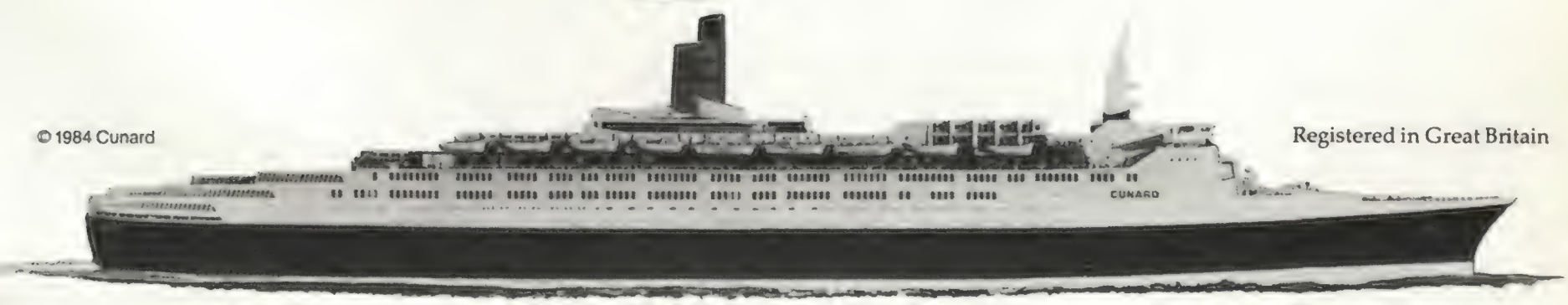

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This past December, *Sea Cloud* voyaged across the Atlantic from Las Palmas, in the Canary Islands, to her present home port of Antigua in the Caribbean. She had about 40 Smithsonian Associates aboard. They had a fascinating time, soaking up the sun and learning about dredging for algae and other bits of mid-ocean life under the tutelage of two marine zoologists, one of whom was my old friend Clyde Roper, the man who acquired one of the world's largest and possibly most revolting-looking giant squids (see this column for April 1983).

On December 11, 1983, at 1730 Greenwich mean time, on or about a north latitude of 17 degrees, 16 minutes, and a west longitude of 39 degrees, 44 minutes, things must have got a little dull aboard the *Sea Cloud*. Everyone, passengers and crew, suddenly wrote messages, corked them into about 100 wine bottles and chucked the whole lot overboard. Actually, it was a carefully planned ceremony marking the exact mid-Atlantic.

"We had a get-together with the crew that day," says my informant, one of the ship's passengers, "and Clyde Roper gave us his demonstration on how to prepare squid for cooking. Then everyone gathered on the ship's fantail and filled out sheets that someone had run off on the duplicating system, writing down names and addresses and maybe a message, and asking that the finder write where the bottle showed up and return the sheet to the Smithsonian." That way, the National Associates travel people could see how far and fast and in what directions the bottles had drifted.

At time of writing, ten bottles have been reported found. And my map indicates that they must have hung together like a flock of migrating birds across half the Atlantic, taking similar paths.

Two came ashore at Antigua, right in the wake of *Sea Cloud*, though they were found long after she picked up her mooring. Three were beached on Barbuda, which belongs to Antigua and lies about 30 miles north of it. Two slipped past those two Leeward Islands and struck Nevis, about 40 miles west of Antigua. One skimmed by Barbuda to the north and hit Saint-Barthélemy some 70 miles west. This, incidentally, was the first bottle to be picked up. The date: March 11. Two others managed to get to Puerto Rico.

The returned papers reveal some interesting twists. A woman from Saint-François, Guadeloupe, found two of the bottles on the same day at Pelican Point, Barbuda. The third Barbuda bottle was reported by a tourist who was, he writes, on a four-mile walk when the discovery was made. Struck by the fact that his find came from what had once been Marjorie Merriweather Post's private yacht, he added, "We live five miles away from Mrs. Post's old estate on Long Island."

A man from Bethesda, Maryland, visiting the West Indies, found the first bottle —but unfortunately it wasn't the one thrown by a passenger from the same place. Nor was *that* bottle found by the man from Bethesda Village, Antigua. And a passenger who appended the note, "Hey, baby, meet me on the corner tonight!" had his bottle picked up by a woman whose first name is Brigitte.

It sounds like fun. Makes you want to go hock the Smithsonian mace and take a cruise.

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Phenomena, comment and notes

A marsh on the verge of better days faces a new threat from an aquarium plant that runs amok in the wild

My favorite marsh is under attack again, this time by a runaway aquatic plant. The invading horde stays submerged until July, when new growth reaches the surface in a tangled profusion that makes waterways all but impenetrable.

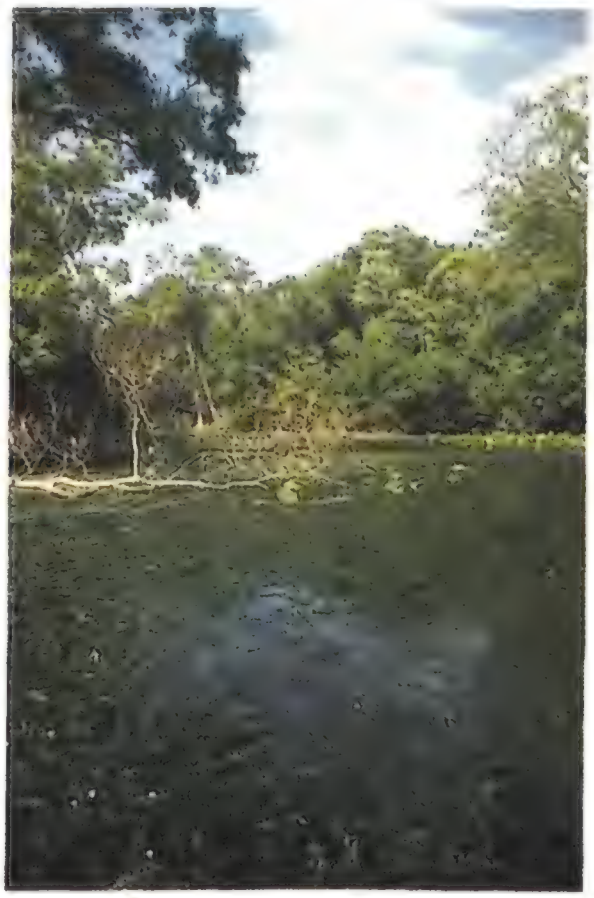
A lot of people are upset. Not only is the marsh being choked, but the "pernicious weed" responsible threatens to spread out into the Potomac River and down as far as the first salt water. Nightmare images are evoked: tributaries clogged like some rivers in Florida have been since 1960 (right). Ecologists worry about native plants, just beginning to return as the river is cleaned up, being crowded out. Boaters worry they'll have fewer places to go; marina operators worry the boaters will have no place to tie up.

The new threat is *Hydrilla verticillata*, a feathery aquatic originally imported as an aquarium plant. To counter it, there is now a Hydrilla Regional Action Committee operating under the auspices of the Interstate Commission on the Potomac River Basin (ICPRB). The best hope is control rather than eradication. Hydrilla is a formidable adversary. It spreads by sending out runners through the mud. It also grows from tubers. Kerry Steward, a hydrilla expert flown in from Florida to study the situation, estimated the plant could produce up to 48 million tubers per acre in the Potomac. Worst of all, hydrilla also grows well from cuttings and fragments: attempts to cut open channels through the jungle are doomed to accelerate the spread, releasing fragments into the water which can take root and begin another plant. Boats can hasten the spread, and so can ducks.

The hydrilla has appeared at a critical time for the river. The Potomac has come a long way in the past decade or two. Strollers along the shore no longer encounter signs advising them to wash with strong soap if any river water touches their skin. The marsh is rebounding along with the rest of the river as cleaner water returns it to some of its old biological richness. Beavers build their lodges. Mink hunt there (as evidenced by road kills). Otters are back, and so are ospreys.

Underwater vegetation is slowly reappearing along the whole stretch of river for the first time since the 1930s. But essentially the hydrilla is filling an empty niche. It is taking root where no plants have grown for decades, and doing for the ecosystem what the lamented lost vegetation was doing. The hydrilla plants photosynthesize like any good chlorophyll-bearing plant and oxygenate the water. They provide food for grazers and a home for the tiny invertebrates essential to the food webs that include the higher predators we humans walk in the marsh to see.

Some of the traditional plants were named for their chief beneficiaries, or



Hydrilla, here choking the Wekiva River in Central Florida, is moving north.

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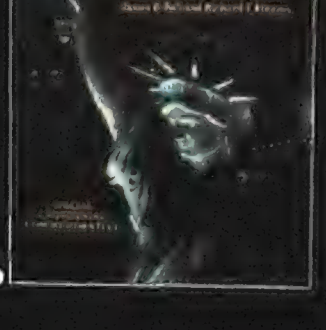

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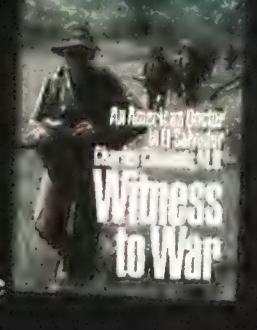

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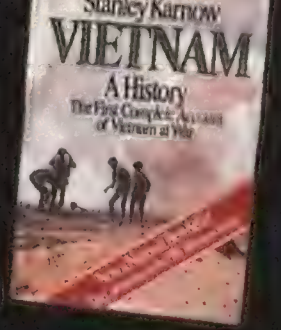

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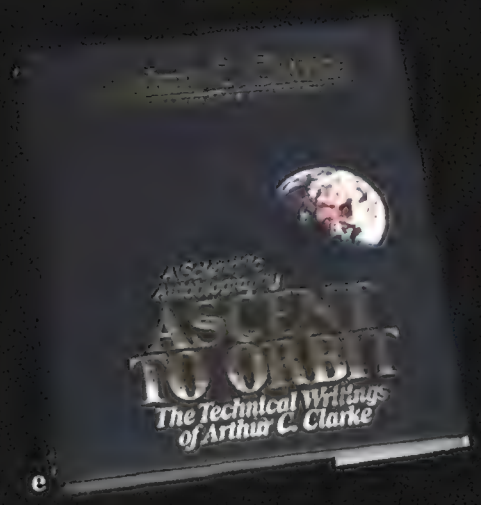

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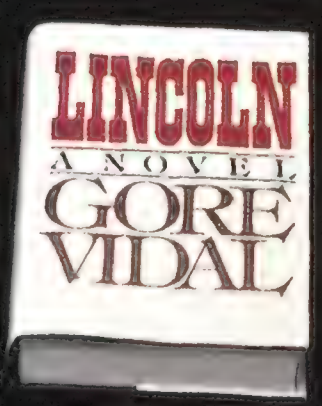

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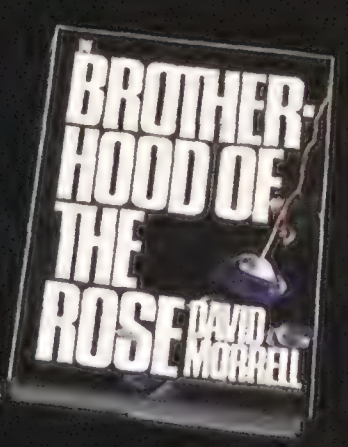

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vice versa. Thus one plant is widgeon grass, another is redhead-grass, named for the ducks that feed on them. The scientific name of the canvasback duck, on the other hand, is derived from the scientific name of wild celery, one of the bird's favorite foods.

Names like these are intrinsically appealing to me. The U.S. Geological Survey, which made a survey of aquatic plants in the tidal Potomac as part of its hydrology studies, has published a booklet showing where 14 of the plants can be found today. For each species there is a map of the river, with red dots showing where the plant still grows and yellow showing its potential distribution, based on salinity. The red dots look very lonely in great stretches of yellow. Only a couple show up near the marsh.

It would seem that any submersed aquatic would be better than none. And yet nobody wants hydrilla to take over the river. Steward estimated that it could grow on 33,000 acres of riverbed between the fall line and the beginnings of salt water downstream. Isolated stands have already appeared, but the marsh is still the principal concentration. The goal is to confine it there while ways are found to control it. The National Park Service, which manages the marsh, is going to experiment with containment booms across the principal waterways. Inside the booms hydrilla will be handpicked, burned at low tide and covered with opaque sheets. In some places fine mesh screen will be used to keep the hydrilla pressed against the bottom, thus reducing the light reaching the plant. (This technique will also produce fishing holes. It is one thing to hook fish in a hydrilla jungle but quite another to land them; the line gets hopelessly entangled.)

Some experts are saying that only chemical warfare will work, but everyone concerned is going slow on that front. The marsh and the river are an open system, connecting to Chesapeake Bay and eventually to the ocean. There is a herbicide that is approved for use against hydrilla, but only in Florida.

The marsh is nothing if not resilient, and presumably will survive the on-

Come to Canada.

Banff, Alberta

slaught. It absorbs the worst that nature offers: storm surges, for example, expend themselves on natural breakwaters where pumpkin ash trees have toppled at the water's edge. It has endured dredging and the dumping of construction debris, and shrugs off the acres of trash that arrive each day with high tides. The marsh has been there for thousands of years, forming out of sediments from upstream creeks, and—allowing for the setbacks from dredging—is still growing.

In late May the invasion was not yet visible. Hank Snyder, the National Park ranger who keeps an eye on the marsh, took me through it in a whaler one crisp bright morning. A native of the California desert, he has become an expert in finding the deep parts of the "guts," the serpentine leads of open water that carry the tidal flow. Only once did our propeller rototill the dark mud beneath us. Sweet flag and cattails were coming up green through last year's growth; arrow arum was forming great clumps in shallower water. Great blue herons took flight as we put-putted up channels; kingfishers abandoned their lookout perches. A magical place, within striking distance of a subway station.

In May it was hard to believe that hydrilla could harm such a place. But by now it will be impossible to take a boat through those same guts. According to an ICPRB newsletter, hydrilla "forms dense, at time odorous mats on the surface that can shade light from desirable plants, hinder navigation, clog water intakes, provide an insect habitat too thick for control by predatory fish, and greatly limit swimming, boating and fishing. The plant's foliage dies in the fall, and its decay into basic nutrients creates an excessive demand on the water's oxygen content—oxygen required by fish and other organisms." The stuff is a serious threat. But I can't help thinking that the marsh will survive. Sooner or later some ravenous creature that just can't get enough hydrilla will turn up, and a semblance of balance will return. My best bet is that the marsh will be there long after the hydrilla—and we—are gone.

John P. Wiley jr.

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For Mercury Cougar, sales during 1983 increased 530% from the year before.*

And in the first two months of 1984, Cougar sales increased more than 600% over the 1983 figures.**

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†Total industry retail deliveries increased 15% based on total industry retail deliveries from February 21 to December 31, 1983, vs. the same period the previous year. Get it together—buckle up.

*Based on manufacturer's reported retail deliveries from February 21 to December 31, 1983, vs. Cougar XR-7 sales for the same period the previous year. **Based on manufacturer's reported retail deliveries during January and February 1984 vs. 1982 Cougar XR-7 sales for the same two months in 1983.

med an entire industry.

of the Mercury Cougar was a significant departure from traditional American car styling.

To introduce it at a time when most cars in its class had not undergone significant changes in several years was a risk.

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Mercury Cougar

Lincoln-Mercury Division Ford

20
20
20
20

By James R. Chiles

Age-old battle to keep safes safe from 'creepers, soup men and yeggs'

Every 'improved' money vault has lured canny thieves—with crowbars, nitro or just plain itchy fingers—to test its mettle

"I never got into blowing safes. This system is far better than blasting."

Speaking is a convicted safecracker living in a Midwestern prison. I agreed to protect his identity, so call him Jack. "Eight or ten seconds is all I need to get the money and go," he says of his technique. "I don't deal in minutes."

Outside prison, Jack was a "creeper." He would walk confidently into an office or restaurant at the height of the business day, find the safe and lean against it while he delicately spun the combination dial. Two out of ten times, he says, he found the safe sufficiently unlocked for him to finish the combination.

Jack's specialty is one branch of safecracking, a crime that has contributed much to American movie and television plots. Most safecracking relies heavily on tools and arcane knowledge. A related villainy, vaultbreaking, has much in common. Their techniques, ever improving, have kept safe and vault manufacturers busy replacing obsolete equipment, and their histories illustrate how competition forces technology to advance.

First, some terminology. A vault is an armored strong room; banks and jewelry companies use them. Today a typical vault has walls of steel-reinforced concrete one foot thick. The 3½-inch-thick door is opened by dialing the proper combination, but only when a time lock permits.

Burglar's-eye view: a newly drilled hole through door of safe admits tiny flashlight and tool to probe lock.

Safes fall into two types: fire-resistant, concrete-insulated safes for records, and burglar-resistant money safes. A money safe usually includes a combination lock on the door, bolts to hold the door closed, walls of hardened steel and copper, and a "relocking" device to thwart attacks on the lock.

Safecrackers and vaultbreakers borrow techniques from the latest scientific breakthroughs as well as from the old-time burglar. Novices can find enough old or cheap safes to make a living; they use tools common to home workshops. Penetrating tough safes and vaults, however, requires special equipment: torches, high explosives and industrial drills. No metal or stone can hold out indefinitely against these. But burglars need time, many weekends in some cases, because tough walls slow them down and good alarms call police before the job is done.

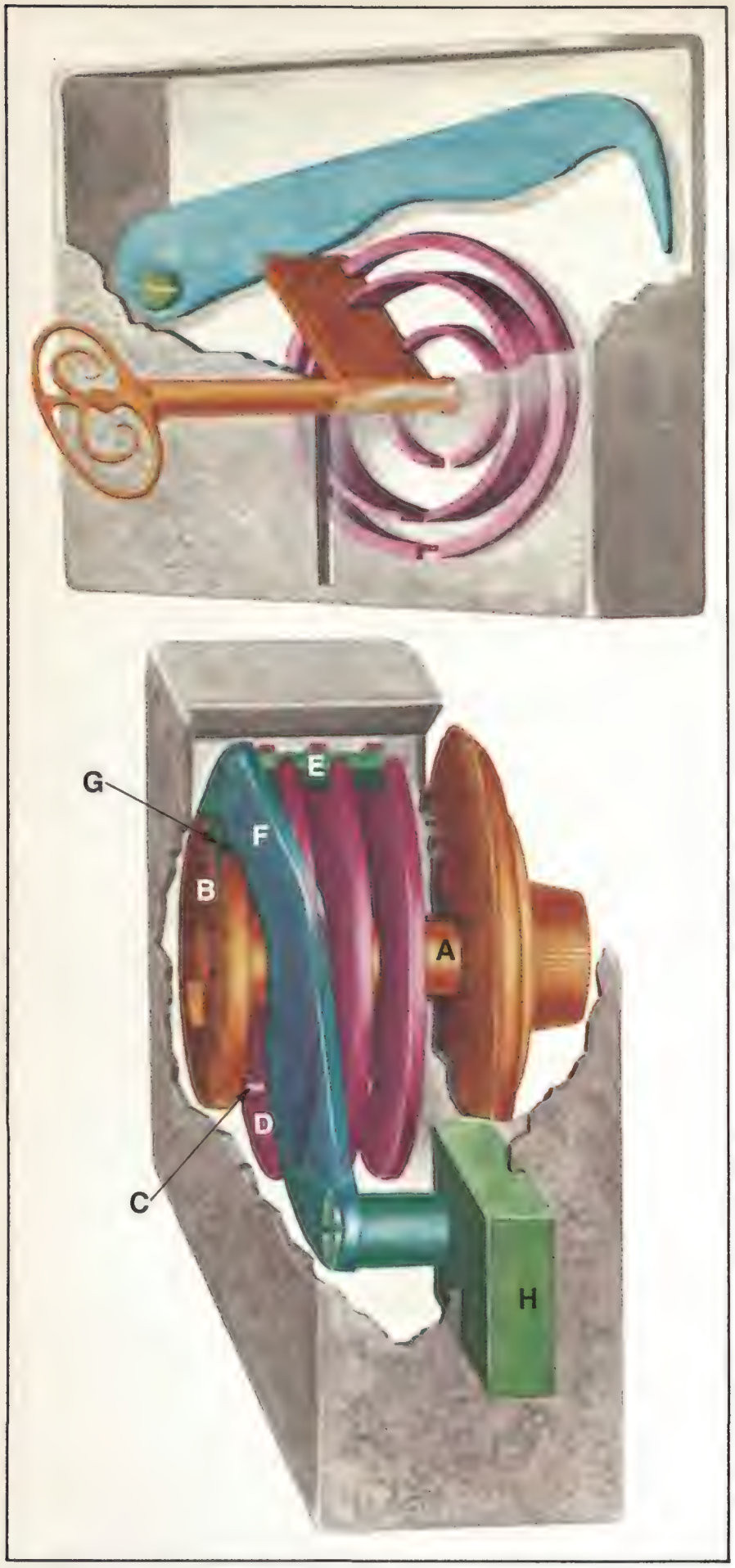
The push and pull between manufacturers and criminals is an ancient contest, and no final victory is in sight. Even the rise of computer crime and armed robbery has not eliminated the lure of caged cash. One recent innovation by burglars is so effective that I agreed to reveal nothing of what the police told me.

Safecracking and vaultbreaking are at least as old as the pyramids and burial chambers of Egypt. By 1000 B.C. burglars had plundered all but one of the tombs in Egypt's Valley of the Kings. They broke into the burial chamber of Cheops' Great Pyramid just 400 years after the pharaoh's death.

For securing homes and storerooms, the Egyptians invented the first known door lock. The householder inserted a three-foot-long key studded with pegs into a large, hollow bolt holding his door shut. The pegs raised hidden pins that held the bolt fast. Pulling on the key freed the bolt and the door was free to open.

The next real advance was Roman: notched and grooved—or warded—locks of iron or bronze construction. (The principle survives today in the locks on the bathroom doors of many older houses.) Some keys were small enough to carry in the palm, on a finger

Photographs by Brian R. Wolff



In the warded lock (top), a key will turn only if the notches correspond to the raised obstacles, or wards, in the lock. When key turns, latch (blue) is raised. Rube Goldberg would have liked the combination lock (below). Dial moves spindle (A) which turns a drive cam (B). Peg (C) on the cam turns the first tumbler wheel (D); a peg on the first wheel turns the second, and the second turns the third. When the slots on the wheels are lined up at the top, the fence (E) drops down, allowing the entire lever (F) to drop. The "nose" of the lever (G) fits a notch in the drive cam. Now when dial is turned farther, the drive cam pulls the lever and with it the bolt (H), allowing the door of the safe to be opened.

Historic locks include, top, a 16th-century French "masterpiece" made by locksmith-guild apprentice, in which pressing button in lintel opens keyhole cover; and, below, a 19th-century Central European padlock.

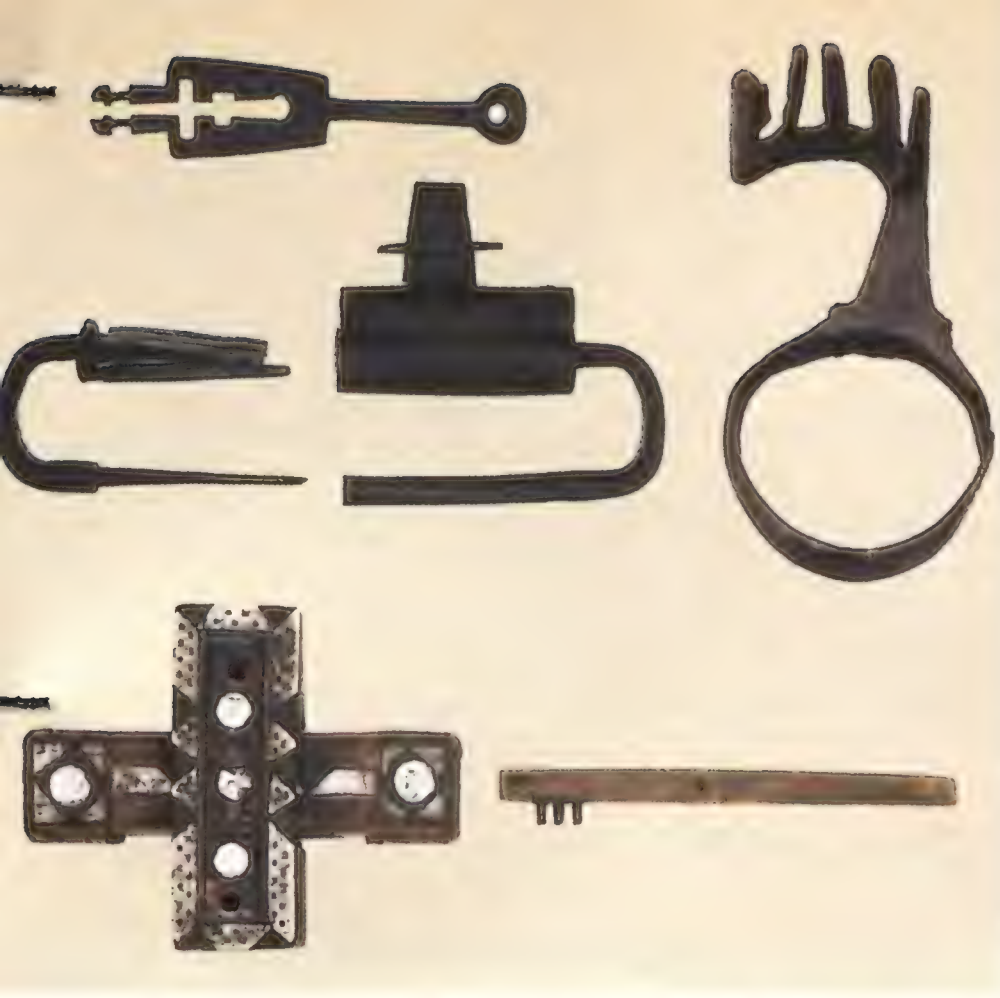
ring—particularly handy since togas had no pockets. Padlocks appeared at about the same time in the Roman Empire and China.

Warded locks like those of the Romans prevented the wrong keys from turning the lock. Locks guarding the doors and treasure chests of the Middle Ages were also warded. Warded locks are not difficult to pick, so locksmiths sometimes disguised the keyhole with webs of fine metal filigree, or hid it with plates released by hidden tabs. Other locksmiths armed money chests with darts, pistols and finger traps that could be triggered by tampering.

Harder to pick were the lever-tumbler locks, invented in the late 1700s, and the pin-tumbler locks, perfected by Linus Yale sr. and jr. in the mid-1800s. But a burglar's gunpowder and his "jack in the box" (a wedge-and-screw device used to crush the lock inside) thrived on keyholes. And keyholes were also vulnerable to lockpicks.

Until the Civil War, most American bankers were content with key-operated locks. They bought vault doors and safes of thin iron plate. Indeed, some banks had no vaults and relied solely on safes. Up until the mid-1860s, safes had wheels that invited burglars to drag the boxes away. An alarm was the dog next door.

If any one man was responsible for changing bankers' minds about keyholes, it was a gentleman farmer named Langdon Moore, who led a secret life in the New York underworld. In 1865, with help from a lock-



Other entrants in the long search for the perfect lock are an 18th-century Chinese padlock (above, left); a Roman ring key from 200 B.C. (above, right); and an Egyptian-type lock and key, Asia Minor, 300 B.C.

smith gone bad, he made multiple nighttime visits to the Concord Bank of Concord, Massachusetts. He puzzled out each door and vault lock in turn. Finally, on September 25, Moore entered the bank, which was shut for the lunch hour, and opened seven vault locks to strip the bank of $350,000 in negotiable bonds.

Keyholes on vaults and safes were already obsolete by the time of the Concord theft. Linus Yale jr. had introduced a combination lock (opposite) three years earlier, and the principle was hundreds of years older than that. There were so many possible unlocking numbers, one million permutations in a typical lock, that it was useless to try every one. Burglars paused and examined this new device for vulnerabilities.

Two of its weaknesses were mechanical. Burglars could drill through the face of the safe and into the lock case, and use mirrors to find slots on the combination wheels. Or they could knock the combination dial off and punch or pull the spindle. This forced the locking mechanism out of position and freed the operating handle. Some manufacturers replied by armor-plating the lock case and door, adding a collar to the spindle to resist punching, and moving the lock case.

Other weaknesses had nothing to do with the lock. Burglars started kidnapping bank officials and forcing them by torture or threats to open their vaults.

The real solution to these problems came from a master locksmith named James Sargent. Sargent was already famous in the industry for having invented a way to open combination locks without force, and then inventing a way to defeat such attacks. In 1873 Sargent joined two eight-day alarm clocks to a combination lock—he called it a time lock. Bankers were slow to adopt it: they feared the clocks would jam and bar them from opening their vaults. Fear of kidnapping was stronger, though, and by 1874 the first bank had installed one.

Because the time lock rendered the combination lock unworkable until the passage of the time set, it was thiefproof. Unfortunately, burglars knew of more than one way to skin a vault.

After the Civil War, burglars had joined in itinerant gangs to travel the country; homeless and mobile as the freight trains they rode, they were nearly impossible to trace. They called themselves "yeggs" and toted heavy tools to bypass the locks. One tool looked like a giant old-fashioned can opener—it ripped through metal walls. Another, the drag, which was a powerful screw clamp, crushed the walls of a safe. With a sledgehammer a man could shatter iron hardened to resist drilling.

Even more formidable was the simple steel wedge. Since early safes and vaults had square doors with square, flat edges, the safecracker first pounded a razor-thin wedge between door and frame. He followed with thicker and thicker wedges as the gap widened, until the wedges got so big that burglars needed steel cables and heavy jackscrews to force them in. Gunpowder or long levers (called sectional jimmies) could then force the door from the frame. Some burglars sealed the door crack and used suction from an air pump to draw fine gunpowder down the cracks from the top.

Manufacturers redesigned the way in which door met frame to include a stairstep or tongue-and-groove arrangement that stymied the wedges. Enter the yeggs'

Marker at center of this 1878 manual time clock shows that 7½ hours remain before safe can be opened.

In publicity stunt, cocky locksmith embarrassed the manufacturer of new "impregnable" safe by cracking it in 22 minutes flat. Yeggs sometimes posed as bankers so they could study new models in company showrooms.

magic elixir: a yellow, oily liquid with nitric acid and glycerol known as nitroglycerin. In the 1870s some burglar discovered that he could crumble sticks of dynamite into a kettle of boiling water, let it steep awhile, then draw off nitroglycerin from the pot. Soon, hundreds of burglars were simmering dynamite over open fires in the thickets of the yegg jungles—they called it "soup." Many of the criminals got splitting headaches from the fumes and some of them died in ferocious explosions.

Nitroglycerin made yeggs nearly unstoppable for a decade. The main reason was not its power, though powerful it was, but that it was so well suited to entering confined spaces like cracks. (For an expert's account of how it was done, see page 40.)

Over the next few decades, hundreds of banks, businesses and post offices gave up their wealth to yeggs. By the early 1900s, manufacturers were on the rebound selling safes whose round, finely-machined screw doors fitted so tightly that burglars couldn't force nitroglycerin down the cracks. They were so snug that a piece of cigarette paper could keep them from closing.

Vault-door makers dropped the stairstep design where door met frame because the steps offered a firm grip for nitro to work. The best design proved to be a smooth plug door that tapered inward. A set of massive bars and handwheels on the outside helped to press the door tightly into the frame.

By the 1920s, manufacturers were redesigning vault doors again. They found themselves facing another tool more fearsome than nitroglycerin: the cutting torch. It mixed oxygen and acetylene gas and burned them at temperatures as high as 6,000 degrees F. Hard manganese steel ran like molasses under its sharp blue flame. These torches could burn a small, hand-size hole in safes impervious to nitroglycerin. On larger safes and vaults one of them could cut into the locking mechanism and free the door. Burglars were using them at least as early as 1907. In 1924 they burned open 234 banks. The torch was a formidable but not an ultimate weapon: its gas tanks were too heavy and its flame too difficult to adjust for amateur thieves.

The author, a free-lance writer who lives in Missouri, wrote on the eventual fate of monumental structures in the March issue of SMITHSONIAN.

Yeggs in Hollywood

In *Asphalt Jungle*, 1950, boxman eyeballs vault door.

George C. Scott tries safe blowing in *The Bank Shot*.

Crackers satirized heist films with bungling robbers.

Cat burglar Ryan O'Neal, in *Thief Who Came to Dinner*, uses the stethoscope-and-fingers route.

In *Thief*, 1981, James Caan spilled inside tricks.

Ray Milland tries his hand at it in *Safecracker*.

And "gas yeggs," as they were called, took the risk of burning up the safe's contents.

Manufacturers found ways to foil the torch. They could make the safe and vault doors so thick that torching would take too long. To the walls and door they added sheets of copper alloy—this excellent conductor dispersed the torch's heat. Another defense was tear gas, contained in a chemical compound or vial in the safe walls and released by heat or lock tampering.

Defending the door was the relocker. Triggered by burglar attack, a relocker jammed the door shut by disabling the unlocking mechanism or throwing extra bolts from the door into the frame. Then even the owner could not open his safe's door until a locksmith drilled into certain critical points.

One of the canniest gangs was headed by Herbert E. Wilson (p. 40). Wilson resigned as pastor of East San Diego's First Baptist Church about 1915 to become one of this country's most successful safecrackers. In 1949 Wilson, writing in *Collier's*, claimed that his gang had popped a total of 65 safes and vaults. One of his nerviest exploits was to crack a safe in the lighted front window of a big Detroit grocery store. After capturing the watchman and substituting one of their own men in a uniform, the gang cut a hole through a partition behind the safe, pulled the safe through and set out a fold-up fake safe. Nitro then finished the job.

The likes of Wilson's gang weren't all that bothered bankers of the 1920s. They remembered the chaos of World War I and the Russian Revolution. They wanted vaults proof against all kinds of mobs that might occupy blocks of a city for days, as in New York City's draft riots of 1863. Some major banks installed steam nozzles aimed at the vault door. Doors grew to be two and three feet thick and heavier than locomotives.

It was during this nervous time that the toughest vaults in the world went up—or, in one case, went down. The gold vault of the Federal Reserve Bank of New York, completed in 1924, lies nearly 80 feet below Nassau Street. The 90-ton vault door is a vertical cylinder with a passageway through it, set in a 140-ton steel frame. The door locks by rotating and dropping down in its frame, like a simple plug valve. Here lie more than 14,000 tons of gold.

Most of America's hoard is elsewhere: the Denver Mint, the West Point Bullion Depository (next to the

The self-styled 'King of the Safecrackers' tells his own story

Herbert Emerson Wilson was a San Diego minister who turned safecracker. In Collier's *for May 21 and 28, 1949, he described his first "job," the safe in a Detroit department store.*

We pulled up in the big sedan right on schedule. We were all set if anything went wrong. I had a .38 automatic in a shoulder holster and I was ready to use it. I also had a cute little .25 strapped around my leg just above the ankle, in case anybody should frisk me for the big gat.

We flattened ourselves against the wall on either side of the door, and when the watchman opened up, we fronted him before he could open his mouth. Herb Cox got out his circuit bridgers, for the alarm network around the safe, and I opened my little doctor-size tool bag.

The safe that night looked like a soft one—a soft pete.

It had felt padding between the jamb and the door, so I filled a glass syringe with sulphuric acid and shot it into the cracks. The acid ate out the packing, making space for the soup. Herb Cox and I each kneaded a chunk of brown kitchen soap until it was soft; then we filled in the chinks the way a glazier putties a window. Along the top crack, in the center, I made a little soap cup about an inch deep and two inches wide. I made a second cup for the bottom of the door. The minutes were ticking away and I still had plenty to do.

I unhitched the rubber nitroglycerin bag from my shoulder strap, stabbed the rubber cork with a hypo needle and drew out about half an ounce. I let it drip into the top soap cup while Cox watched the bottom one. The greasy stuff seeped down in the door cracks and in a couple of minutes Cox whispered, "Hold it. It's hit bottom." He flattened his cup to keep the soup from running out and I stuck a detonating cap in mine before closing it up. I unwound about 20 feet of the extension wire I had taped to the cap wires and ran it to the other side of the room.

In 1949, after release from prison, Wilson still had his original tool bag.

We unpacked a couple of old-fashioned comforters from our bags, soaked them in water under a faucet and wrapped them around the safe. I've often wondered whether anyone in Marshall Field's Chicago store was ever curious about that clerical-looking fellow who used to buy a dozen or more comforters at a time for his "boardinghouse."

Next I pulled out a bell buzzer with a push button and a two-way wire system and strung it out to the street. Cox stayed out there and I went back to the safe. I was all set. I pushed the buzzer once and waited. I was strung up like a violin. We had agreed that a double buzz from outside would be the signal to let her blow, but a triple would mean trouble. In that case we'd stop cold, reach for our rods and head for the exits fast.

Those three buzzes could mean anything—a passing drunk, a cop or a shotgun squad from the burglar-alarm agency. It could mean gunplay, murder, prison or all three—and I was to hear it four times in five years. But not that night.

I got Cox's two buzzes right away and touched the fuse wires to a flashlight battery. The explosion made no more noise than a pig's grunt. In all my years on the prowl, I never got over the thrill of hearing that faint boom and seeing what it did to a massive block of steel. The blast was always the climax of a job—a strange, violent relief after dead silence. It almost got to be a ritual for somebody to whisper, "Thar she blows!"

The cash was in the keister, a small, heavy, steel chest found in many safes, and I blew it with a second soup shot. I dumped the contents into a black bag without even looking at it, and ten minutes later we were a mile away from the store, splitting up for the night.

We met in Herb Cox's room at a hotel the next morning and divided $25,000 in cash and $16,000 worth of negotiable Liberty Bonds. It looked like a million to me, but was the smallest haul we ever made out of a safe.

John Launois

Giant vault doors, like this one at Société Générale in Paris, were bankers' insurance against mob attacks.

Military Academy) and a big granite-sided box in Kentucky. The big box is on the corner of Bullion Boulevard and Gold Vault Road, 30 miles southwest of Louisville. The official name is the United States Bullion Depository, but the popular name is Fort Knox, after the Army post where it sits. This mausoleumlike building is 42 feet high and 105 by 121 feet in area. Inside is a two-story concrete-and-steel vault with 25-inch-thick walls. Inside that are 6,000 tons of gold. By its completion in 1936, Fort Knox was a showcase for how to deter burglars. It bristled with machine-gun turrets, alarms, electrically-charged fences, noxious gas and 24-hour guards. No one has ever tried to break in.

Similarly, the improved bank-vault doors and alarms of the 1920s began to have an effect. Bank burglaries dropped by three-quarters during that decade. Meanwhile, armed bank robbery more than doubled—by 1925 a group of Milwaukee bankers were so desperate that they offered rewards of $1,000 for live bandits and $2,500 for dead ones.

Some still open safes with sledgehammers

Today's burglars, vaults and safes have much in common with their predecessors. Burglars still find safes on which they can use the traditional torches, punches, axes, chisels, levers and sledgehammers. Last year, somebody used a sledgehammer to break into New York City's Goldheart International offices, where they stole $6 million worth of gold from the vault. Capt. Arthur Katz of the New York Police Department says that sledgehammers are a very popular tool for concrete walls. Few burglars use nitroglycerin anymore, reports Bob Sibert, a tool-mark expert with the FBI.

Sibert specializes in identifying tools by the distinctive grooves and dents that they leave on safes. "Tool marks are a positive ID," he says firmly. "They mean, 'this tool and no others.' " Sibert has an expert's distaste for a job poorly done. Punctuating his words with an impromptu slide show in his unit's file room, he points to a photograph of a sledgehammered safe. "Knocking off the hinges provides no access to the safe. Locking bars and lugs hold the door shut. If we see the hinges knocked off, it's obvious they don't know a thing about what they're doing."

The yegg subculture has passed on. Seventy percent of safecrackings are amateur jobs now, says Bob Rosberg, director of the Mosler Safe Company's Anti-Crime Bureau. To know his adversaries, he once joined a group of lawyers, judges and executives to spend three days in the Ohio penitentiary. Most of his working days he travels for the Anti-Crime Bureau. "We call ourselves the attack force," says Rosberg. Burglars need not apply to the Anti-Crime Bureau classes. "Before we tell applicants where we're holding the class," he says, "we check them out through their company. We've been burned before."

How do today's burglars learn the job? Veteran safecrackers will accept novices as apprentices. "Doing it is the best experience," an Ohio prisoner says. "He comes along with you, you take the box to a safe place and let him watch while you work on it." Some burglars are specialists, attacking only models of safes they know inside and out.

Illicit photocopied manuals circulate inside the prisons; two that Bob Rosberg has seen are *Guide to Successful Safecracking* and *Lockpicker's Manual, Part II*. Correspondence schools teach electronics relevant to defeating burglar alarms. (Rosberg claims that

his staff can defeat 97 percent of all the burglar alarms made. "And we can do it with less than $15 worth of electrical gear," he adds.)

Some breakers still hope to evade detection by tunneling. A group branched off a sewer under Nice, France, to bore into the Société Générale's vault in 1976 and rifle safe-deposit boxes of about $10 million. Police caught the mastermind, Albert Spaggiari, but he leaped through a third-floor courthouse window four months after arrest and escaped on a motorcycle.

In walls and doors, copper layers are still effective against acetylene torches, as is a new concrete salted with thousands of superhard fibers of aluminum oxide. This "composite" is also resistant to the portable drill presses, electric impact hammers and grinding wheels of the modern burglar's kit.

But no physical barrier can stop one tool: the burning bar (p. 45), which has the simplicity of the truly powerful device. "It changed the notion of what is burglarproof," says a locksmith who declines to be identified. "Nothing is burglarproof now."

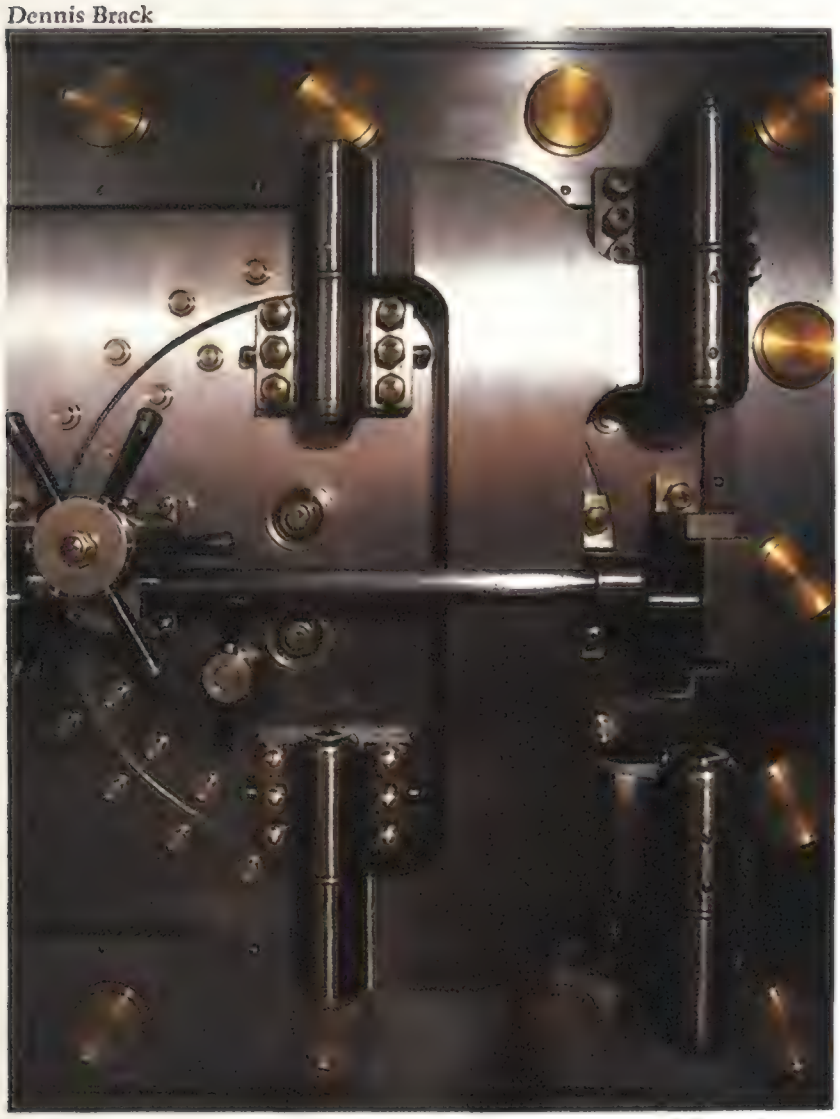
The burning bar is a steel tube filled with thin metal rods. Hooked via hose to a large oxygen supply and ignited with a cutting torch, it burns like a giant sparkler at temperatures of 8,000 degrees F or higher. It will melt through a diamond, the reentry shields of spacecraft and any other solid that gets in the way. It has been used in more than a few burglaries. In 1978 a gang of international bullion thieves used the bar to cut through a vault door in England. But, says Bobby Blackburn, head of the FBI Academy's Forensic Science Training Unit, the bar has never caught on in a big way. It is bulky and hazardous.

Another device of tremendous power but limited use is a construction tool called the diamond-core drill. It is heavy and awkward and requires much power and cooling water, but its diamond-studded tube can chew a cylinder out of several feet of concrete and heavy reinforcing steel.

In a 1972 burglary of the Laguna Niguel branch of the United California Bank, a group of professionals core-drilled holes into the concrete vault roof and stuffed them with plastic explosives to blast a manhole. Clearing reinforcing rods with a torch, the gang entered and battered open hundreds of safe-deposit boxes. They stuffed feed sacks with $5 million in stock, jewelry, bonds and cash. Classic detective work identified them later that year.

A rarer animal than the core drill is the cannon. On a weekend in 1965, an unusually audacious gang used a Finnish 20-millimeter antitank gun on a Brink's vault in Syracuse, New York. The men moved the 100-pound gun into the building and blazed away at a concrete wall until they had a hole big enough to crawl through. They escaped with more than $400,000.

Dennis Brack



Dual-combination bank-vault door is so finely balanced that it can be closed by one person with little effort.

Opening a safe with sensitive fingers

On the opposite end of the loudness scale is the quietest and most mysterious technique, manipulation. In a 1910 Broadway play called *Alias Jimmy Valentine,* the reformed burglar/hero sensitizes his fingers with sandpaper and dials open a lock to free a child trapped in a vault. Sandpaper aside, that's manipulation: opening a combination lock by the dial—without any tools and without any knowledge of the combination. The manipulator uses nothing but his fingers, feeling for extremely subtle vibrations that indicate, for example, that a wheel has lined up with the fence (p. 36, left caption). It is impossible to achieve on some designs of combination locks, though, and on any safe or vault protected with a time lock. Manipulation requires a profound knowledge of locks, a fine touch, some mathematics—and something more.

"Manipulation is really an art," says locksmith Scott Reed. Reed once taught other locksmiths the secrets of manipulation for a company called Lockmasters, Inc. "You have to practice constantly, open a couple of safes a week or you'll lose the touch." Reed

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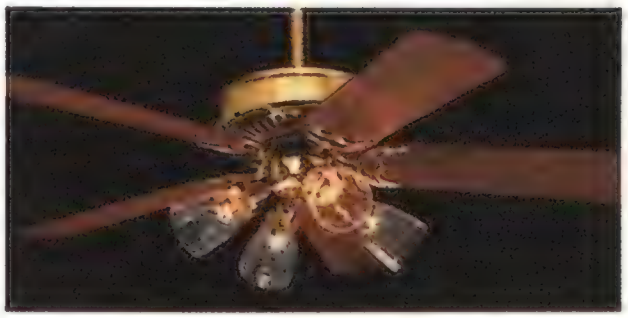

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says his eyes, fingers and some graph paper are all he needs to divine a combination from many locks. What about the stethoscope of popular fiction? He'll use one when the surroundings are noisy.

Locksmiths use manipulation to open safes after owners lose the combinations. Harry C. Miller, a founder of the Lockmasters school and one-time owner of a major lock company, once traveled widely to manipulate safes full of gold and jewelry: for Chiang Kai-shek in the Nationalist retreat from China, for Fulgencio Batista of Cuba, during riots in Cairo and for the Roosevelt family estate.

Have criminals ever mastered the art of manipulation? Experts chuckled at reports of "Jimmy Valentines" until the capture of one-time electrical engineers Willie and Frederick MacLaren at a New York hotel in 1936. Detectives checked their unsolved case files and came away convinced that brother William had finessed safes across New York City and as far away as Chicago, though they could prove little. In 1937 the law sent him up the river to Sing Sing Prison for possession of burglar tools.

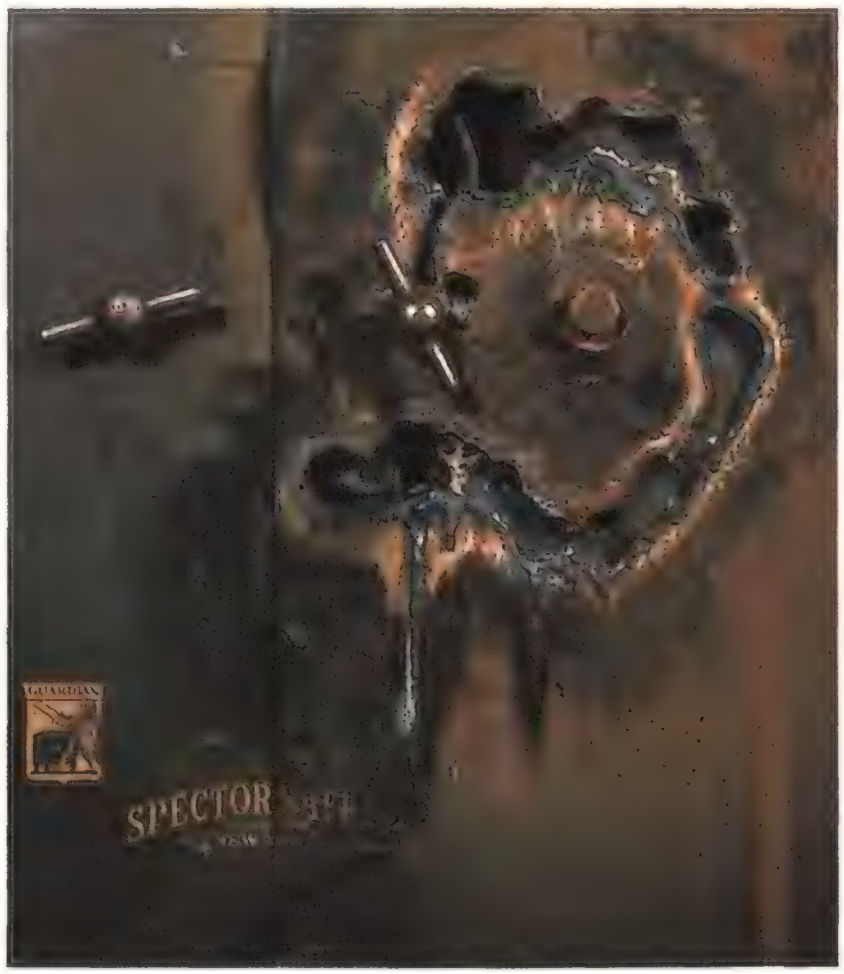
Miller and Reed agree that manipulation by criminals is rare now. And manipulation is more likely to occur in international or industrial espionage than in cases of common burglary. (Spies in particular like manipulation because codes and plans are much more useful if the victim doesn't know the safe has been breached.) Manipulation is too difficult and uncertain for the average burglar. Reed says he might spend 30 minutes to an hour opening a safe by hand. "Burglars don't have time for that. They'd rather stick a wad of plastic explosive on the door and see what happens," Reed says. "If it doesn't work, they'll go next door."

Some cases look like manipulation but aren't: the culprits may have obtained combination numbers by snooping. One gang specialized in using movie cameras with telescopic lenses to peer through storefront windows at the dial as managers turned the combination. Other burglars have beamed industrial X-ray machines at the mechanism to reveal slots in the tumbler wheels.

X-ray machines are newcomers to the burglars' arsenal. Some industrial tools are so new burglars haven't used them yet: plasma torches of 18,000 degrees F and hotter; super-high-pressure water jets that tear concrete apart; and microwave concrete breakers. The carbon-dioxide laser has probably been used.

Dwarfing all these tools in criminal potential are the computer (SMITHSONIAN, August 1982) and the increase in "electronic banking." As much as a trillion dollars in credit moves down the telephone lines between Federal Reserve System members and commercial banks each day. A sophisticated knowledge of how the system works can enable a thief to siphon millions of dollars from electronic accounts.

Swinging a sledgehammer against concrete is dustier and more tiring than electronic theft. But computers haven't made safecracking and vaultbreaking obsolete yet: the FBI registered 551 bank burglaries in 1982, up from 432 in 1978. Poking holes in vaults and safes for profit—a crime as old as the pyramids—appears to be as durable as greed.



Holding 8,000-degree-F burning bar, asbestos-suited expert (opposite) melts through door of an old safe, totally obliterating the area around the lock (above).

By John Russell

A face that really launched 1,000 ships —and many more

Though Miss Liberty's debut was complex and eclectic, today she is being fondly refurbished for her 100th birthday party

A model for Liberty's face was noted domestic tyrant Auguste-Charlotte Bartholdi, the sculptor's mother.

Now being renovated and refurbished for its centenary with funds raised from all over the country, the Statue of Liberty may well be the single most seductive structure erected anywhere in the world during the past hundred years. It has a great location. It has stood up to everything that wind and weather can throw at it. It is part of a universal folklore. Yet when seen at firsthand, it never fails to astonish. "That's *it*!" we say to ourselves as the aircraft grinds round and round in a holding pattern above Lower Manhattan. "That *has* to be *it*!" And we find comfort in the fact that it is still there, holding its lamp aloft and still (to quote its original title) "enlightening the world."

It has a twofold magic. It stands, self-evidently, for an ideal of fair dealing in human affairs that is spelled out in the American Constitution and never fails to move an imaginative visitor. Once past that statue, we think, anything is possible, and all shackles are cast off. That idea is made visible not only in the forthright, chesty and protective stance of the statue itself but in the elementary fact that it has never fallen down. It comes, after all, not only from the studio of a sculptor but from the drawing board of an engineer of genius called Gustave Eiffel. He was in the business of making things that did not fall down, and he lived in an age in which it was axiomatic that all problems could be solved. For Auguste Bartholdi, the sculptor who designed the statue itself, Eiffel was the ideal, the indispensable, the predestined partner.

Eiffel and his contemporaries were of our own day, in that they preferred light, aerial, insubstantial-seeming but perfectly calculated structures to monumentalities of brick and stone. Ever present in their imaginations were the disasters to which brick and stone had stood as sponsors. The Statue of Liberty doubles as a lighthouse as well as a statue, and Eiffel could not have forgotten the tribulations of the Eddystone Lighthouse. First built in wood and stone off the coast of Devon in 1699, the 100-foot-high structure was washed away, with its designer inside it, in 1703. A second attempt, sheathed in wood, burned down in 1755. A third was eaten away by the sea and eventually had to be dismantled. Not until 1882 was the curse of the Eddystone rocks put to rest. These were somber auguries.

The Statue of Liberty was on every count a structure that had to be got right the first time around. Too much was riding on it for it to be anything but a total and lasting success. There was the pride of the Republic. There were the hopes of the teeming millions who, give or take a nought or two, would remember it as the first thing they saw in America. And there was the pride of the French people, who had struck off their own shackles more than once during the previous hundred years and did not care to have a fiasco on their hands.

Monumental face, crownless and framed by flimsy supports, waits in New York for assembly in 1886.

How the Statue of Liberty was born

Dynamic predecessor of Bartholdi's decorous statue was Delacroix's painting, *Liberty Leading the People.*

All this being so, it was a piece of the greatest good luck that Bartholdi and Eiffel ever got together. As a citizen and as a man of his time, Bartholdi had all the right convictions. He believed in freedom the way Beethoven believed in it when he wrote the dungeon scene in *Fidelio,* and the way Verdi believed in it whenever he had tenor and baritone stand side by side at the front of the stage and sing of freedom, evoking the collective memory of the Risorgimento. During the Franco-Prussian war Bartholdi had been aide-de-camp to Garibaldi himself, and it was through no fault of his that Garibaldi did not succeed in his last-minute attempt to galvanize an army and stave off French defeat. Bartholdi had a sense of élan in his heroic monuments, and he had a sense of the colossal that had been nurtured by a journey up the Nile in 1856.

But—how to put it politely?—he did not have a sense of stability. The subjects of those headlong effigies of his looked as if they had been overcome by a cramp at an inconvenient moment. His most successful piece—familiar to many an American visitor because a copy of it stands in the Place Denfert-Rochereau—is the Lion of Belfort. Such are the associations of the heroic defenders of the stronghold of Belfort against the Germans that we pass over the fact that this particular king of beasts looks to be under sedation.

All over Europe, an urge to stand tall

Bartholdi had a lifelong craving for gigantomania. Too late for the Colossus of Rhodes, he was just in time for the wave of very large standing figures that swept across Europe in the 19th century. From the unrealized 230-foot-high statue of Britannia that was fancifully proposed by John Flaxman as early as 1799, to the hardly less enormous statue of Arminius near Detmold in Westphalia, the urge to stand tall was felt all over Europe. In 1852 Bartholdi had witnessed the visionary zeal with which students at the Ecole des Beaux-Arts threw themselves into a competition for an idealized lighthouse. The notion of carrying and casting light was to haunt him throughout his life. In 1867, when the Suez Canal was nearly complete, he tried to get a commission for a gigantic female figure that would cast light not only from a torch held high but from a broad band around her forehead. Nothing came of it in Egypt, but Bartholdi was not the man to waste a good idea.

Nor did he have to wait too long to put it into effect. A born republican by nature, and a witness to the decline and eventual collapse of Napoleon III's imperial regime in France, he dreamed of going to America and, once there, of making his fortune in traditional style. One of Bartholdi's great strengths, and one that served him well for the Statue of Liberty,

Rough terracotta models, done by Bartholdi before he reached his final conception, include a lighthouse design (center) originally intended for the Suez Canal and four female figures with one hand upraised.

was that he never recoiled from the obvious. He did not aspire to change the course of art, but rather to speak for the tried and the true. As of the summer of 1865, he had been privy to the councils of those intelligent Frenchmen who wished to ensure that France once again became a republic—but a republic established within the law, and without bloodshed, and in a spirit of exalted enthusiasm.

It was in this same spirit, and borne along by the flood tide of sympathy for the United States of America that followed the assassination of Abraham Lincoln in 1865, that Bartholdi set off for New York in 1871. He knew what to say, and he knew how to make people listen. "I will try to glorify the Republic and Liberty over there," he wrote to his chief adviser in May 1871, "in the hope that someday I will find it again here."

That quotation I draw, among much else that here passes as my own, from *The Statue of Liberty* by Marvin Trachtenberg, a book that I cannot recommend too highly. Like many another European visitor before and since, Bartholdi could not contain his enthusiasm at the sight of the New World in action. He meant it, as others before and since have meant it, and his enthusiasm got through to his hosts. Night after night he described to them the statue—unparalleled in grandeur since ancient times—and he also described the zeal, the generosity and the promptitude with which the French would take up the subscription. By the time each evening's fantasy was full grown, the money was there, the statue was built, and the ancient friendship between France and the United States had moved into a new and glorious phase.

And when he returned to France in the fall, Bartholdi really did have something to show for his visit. He had found the site—then called Bedloe's Island—and that site, complete with fortress, could not have been better chosen. It was the place of all places that no one could miss.

He had to bide his time before going ahead. In the end, $400,000 was to be raised in France and $250,000 in America. The funding and building of the statue, though, were not so much a matter of warmhearted charitable activity as of political maneuvers in which timing was paramount. More even in France than in the United States, the idea of liberty had a great deal riding on its back in the early 1870s. In France, at least

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Cutaway drawing of head, showing the spiral staircase and Eiffel's support system, was exhibited in 1878.

Dwarfed by hand of unfinished statue, Bartholdi stands hatless at Liberty's wrist in his atelier c. 1880.

until the Third Republic was finally set up, it could not be pushed too far or too fast. Bartholdi did not get the official go-ahead until November 1875.

He did not see the Statue of Liberty in purely impersonal terms, or simply as a commission that would make his name, once and for all. As a native of Alsace, a part of France that had to be ceded to the Germans after the Franco-Prussian War, he thought of liberty in relation to the eventual freeing of Alsace from foreign rule. He himself did not go there for ten years after the Germans took over. He had a yet more cogent reason to dislike the new state of affairs: his mother had stayed behind in Alsace and was separated from him.

The fact that Madame Bartholdi senior was one of the all-time great killer mothers of the 19th century did not prevent Bartholdi from venerating her—to the point, in fact, at which he borrowed her features for the face of his Liberty. It is a matter of amazement that this prototype of freedom and generosity in human affairs should have been modeled on a woman who was a byword for bigotry. Such was her hold upon her sons that Auguste hardly dared to get married (at the age of 42) to someone of whom she might not have approved. His brother Charles went out of his mind partly, it was thought, because he was afraid to tell his mother he was having an affair with a Jewish woman.

The features of Liberty in Bartholdi's statue can be read as emblematic of perseverance and determination. They quite lack the emotional momentum, let alone the unambiguous sensuality, the revolutionary gore and the flaunting Phrygian cap that Eugène Delacroix had given to her counterpart in *Liberty Leading the People*, painted in 1830. As to which image puts the more invigorating case for liberty, there can be no discussion. Delacroix's work was so inflammatory that it was not until 1874 that it was hung permanently in the Louvre, 44 years after it was painted. The Statue of Liberty was altogether more decorous.

This was in accord with the American taste of its time. In that context, Marvin Trachtenberg quotes

Here the inner frame of flexible lath over wooden stringers is being covered with a layer of plaster.

The finished statue, partly engulfed by protective wooden scaffolding, looms over Paris in 1884.

an editorial of 1875 from the *New York Tribune*. "In view of the climate," the *Tribune* said, "it may be presumed that Liberty will be draped. Indeed, she is always represented as wearing a sort of disheveled nightdress. There are those who believe that the Genius of American Liberty should be clad in trousers. No Frenchman, however, can be found who shares this delusion, and if the artist will only spare us the odious Phrygian cap, we shall be entirely contented with the orthodox style of drapery."

Bartholdi was not the man to go counter to opinion of that kind, even if his design had not already been virtually completed. (It has to be added that Madame Bartholdi in trousers might have made many a would-be immigrant turn tail.) He was not so much an original poet as an entrepreneur, a manager, a negotiator and a persuader. He also had an unfailing eye for a running mate. In addition to Eiffel he had American architect Richard M. Hunt, and but for Hunt the statue would not have had the pedestal that nobly supports it, never once setting itself up as a rival for our attention.

No sculptor likes to see his work upstaged, and the relation of a sculpture to the ground beneath it is an edgy business. Bartholdi's statue, 151 feet high and weighing 225 tons, had to be hoisted free of the existing fortress. But how free was free? It could not be held up in an unconvincing, unorganic way. Nor could it seem to have settled down on top of an undistinguished hump. To solve the problem, Hunt swiftly produced a design in which mass and detail were ideally contrasted. The final effect was neither to push the statue to a height at which it would look like an irrelevant toy, nor to make it settle too close to the ground. We feel at once that this statue is where it ought to be, and that it will stand there forever.

As is the case with perfect stage management, what Eiffel did for the project passes completely unnoticed. Only in his working drawings can we study the inner nervous system of the statue—the intricate network of

On day of triumph, October 28, 1886, Liberty emerges from joyful smoke of the celebratory steamboat fleet, which also offered a foghorn chorus and 21-gun salute.

support that makes it possible for the huge structure to hold its really rather awkward pose with immunity from mishap. The statue was made of copper, beaten delicately into shape over plaster forms, which were then discarded. What looks at first glance to have been built like the Great Pyramid, has in point of fact an interior that bears almost no relation to the ample and motherly forms of Bartholdi's Liberty. Eiffel saw it as his task to build a slender but strong metallic bone structure, with its joints riveted and bolted together, that would make it possible for those forms to resist the pressures of all kinds that would otherwise have brought them to grief. We know that Eiffel took four years fashioning the armatures that support it.

Bartholdi showed something like genius in the way he placed his statue in relation to the ships that would pass it on their way to the New World. Ships would pass near enough for the statue to make its impact, but that impact would change from moment to moment. By trial and error over a long period, he got the statue to look right all the way from the first faraway sighting to the view from Battery Park.

There remained one final obstacle. The people of America had to want the Statue of Liberty, they had to identify with it, and they had to put down money to get it. But rich people were often nervous of the notion of liberty. Poor people felt excluded from what seemed to be a remote, New Yorkish and wildly expensive undertaking. Besides, the Statue of Liberty was just too damned big. What if it was not art, but propaganda? A piece of offshore bluster? The statue was a gift from the French, in itself reason to be wary. Who were these foreigners to be foisting a statue on good American soil—and expecting Americans to pay to put it up?

If any one man put this right, it was Joseph Pulitzer, who had arrived in the United States from Hungary in 1864 with the idea of fighting in the Civil War. Pulitzer had done very well indeed in the newspaper business. If anyone could turn opinion around, he was that man. In editorials, feature stories and cartoons in the New York *World* and the St. Louis *Post-Dispatch*, he, as much as anyone, persuaded the American people that this was a statue that they just had to have. They agreed—just in time—and in October 1886 the Statue of Liberty was inaugurated, with Auguste Bartholdi way up inside the huge head, all set to pull the right cords. "You are the greatest man in America today," said Grover Cleveland. Close on a hundred years later, it seems that the President had a point.

Up to her elbow in a scaffold for work being done for 100th birthday, Liberty's torch still glows, though it is to be taken down this month for repairs.

. . . and eventually all manner of liberties were taken

"Canonized" by French satirist Michel Guiré-Vaka, statue became vehicle to attack U.S. arms dealing, 1970.

The Marx Brothers took Liberty's place as symbols of America in this clumsy visual attempt at Gallic wit.

In lantern-slide prank, young couple played peek-a-boo around her.

At fancy-dress ball, 1883, Mrs. Cornelius Vanderbilt was "the electric light."

Selling jeans tough enough to last until Liberty falls, an ad invoked gloomy close of *Planet of the Apes.*

Many of the photographs above are reproduced from a book, *The Statue of Liberty*, by Blanchet and Dard, just published in France. An American version will be issued by American Heritage in 1985.

In World War I pageant, actress Nance O'Neil stirred hearts with torch, crown, serious look.

A bustled beauty with a fetching parasol helped sell fabrics in 1880s.

Tossed into an ashcan, Liberty is shown in symbolic decline, 1966.

To mock delays, an 1884 cartoon showed Liberty "one thousand years later" and still "waiting."

Most outrageous use was this 1957 Russian travesty equating American Liberty with a police state.

My, how w

In the back seat of our Civic 4-Door Sedan, we've grown headroom, shoulder room, legroom, hiproom, and kid room.

In the trunk, we've increased our carrying capacity by an amazing 13%. Our glass area has grown, too, for better visibility.

We've included driver comforts like an adjustable steering column, child-proof rear door locks, and optional automatic

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e've grown.

transmission, as well.

But while we were doing all this growing, we didn't forget to keep the sticker price small. That's why this car is for families who want one to grow on.

HONDA

The Civic 4-Door Sedan

Musée du Louvre, Paris

Nothing is certain about this Watteau masterpiece, *Pierrot (*called *Gilles)*: its title, its date, who its models were. But the painting has inspired poets, writers and a remarkable film, *Les Enfants du Paradis.*

By John Canaday

Tender and poetic works of art from melancholy genius

Jean-Antoine Watteau, frail and sickly all his life, filled his canvases with romantic interludes that he could not enjoy himself

By all accounts, Jean-Antoine Watteau, who was born in Valenciennes in 1684, who died of consumption at a friend's country house not too far from Paris in 1721, and is currently the subject of a comprehensive exhibition at the National Gallery of Art in Washington, must have been a charming fellow. He had to have been, to have won the friends he did in spite of his misanthropy, his bitter wit, his quickness in irritation and slowness to forgive—none of which is connectible with the tender mood of his painting.

Upon his death at only 36, an exceptional number of people who had worked with him bothered to set down tributes, clearly affectionate, that initiated an appealing legend of a melancholy genius. "A good friend, but difficult," one of them said, who died young and whose ill health imbued his paintings of amorous dalliance with a poignant sense of the transience of life's pleasures—pleasures closed to him except through the proxy of art. That, at any rate, is the legend that has crystallized around a stubbornly elusive personality.

Nineteenth-century romanticism, relishing as it did the stereotype of the doomed genius, added poverty to the list of Watteau's biographical attractions. The Goncourt brothers called him the "great poet of the 18th century," and Walter Pater characterized the parklike fantasy habitats of his love-smitten ladies and courtiers as "that impossible or forbidden world which the mason's boy saw through the closed gateways of the enchanted garden."

Private collection

Seated Woman, drawn in crayon about 1716, shows Watteau's grace and mastery as a draftsman.

By the time of his early death, Watteau had founded a subschool of French painting without meaning to. Born of imitation, it flourished with a number of immediate followers of talent, was watered down internationally and finally died at the end of the 19th century on the lids of candy boxes. During that time Watteau inspired some surprising contradictory responses from unexpected sources. During his own century in England, the usually rather stuffy, sometimes heavy-handed Sir Joshua Reynolds, theoretician and propagator of the Grand Style, the very antithesis of Watteau's intimacy and delicacy, called Watteau "a master I adore"; while Watteau's countryman Voltaire, for all his French sensitivities, judged him "incapable" of doing anything "big"—by implication, anything important. In 19th-century England, the great Turner, whose cosmic land- and seascapes could swal-

low at a gulp Watteau's tender, secluded little world, said, "I have learned more from Watteau than from any other painter." John Ruskin, Turner's discoverer, patron, sponsor and most sympathetic critic, called Watteau "a mere room decorator" and, while he was at it, killed a flock of birds with one stone by adding that, even so, Watteau was the best painter in a country that had never produced a single great one.

As a "room decorator"—but not a "mere" one—Watteau was indeed a practitioner of the rococo style, and even one of its inventors. It would be difficult to find anywhere a more exuberant rococo invention than his red chalk drawing *The Temple of Diana* (p. 62), which seems to explode into blossom on the paper with a luxuriance of playful exaggeration that makes it as much a comment on rococo style as an example of it. This is surely not what the good Sir Joshua was thinking of when he praised the "correctness" of Watteau's drawing; rather, he had in mind the solidity, flexibility and sound structure of drawings like the superb *Seated Young Woman* (p. 62). Sir Joshua's own drawings had these virtues—solidity, flexibility, sound structure. What he must have recognized in Watteau's, and envied, was their freshness, the light touch, the effect of spontaneity that was beyond the talents of England's reigning academician.

As for Watteau's poverty, his father (the "mason" as Walter Pater had it) was a master tiler, classified under "Bourgeoisie" in the tax register and hence at least well-off, if not wealthy. When Watteau was about 18 years old he went to Paris, where he seems to have been no more than normally hard up in the manner of students and fledgling artists over the course of several previous and a couple of subsequent centuries in that city.

He found work with Claude Gillot, a decorative painter and stage designer, and then, in his early 20s, with Claude Audran, a mere room decorator—but a fashionable and elegant one. Under the wing of an art dealer named Sirois, Watteau was introduced to the collector Pierre Crozat, who, having made a fortune in association with his brother Antoine, the financier, had retired from business to devote himself to the pleasures of good living, art patronage and collecting (500 paintings and 19,000 drawings were included in his estate), and his perquisites as Treasurer of France, a position he had purchased. As a public figure he was known as "the poor Crozat" in contrast to his brother, who was even richer.

Crozat was one of an increasing new breed of aristocrats in France, the aristocrat of wealth with a knowledge of the world, who owed his position to his own aggressiveness, shrewdness and imagination as opposed to the hereditary aristocrats at court whose potentials for something better were vitiated by the supposed good fortune of their birth.

Crozat and his circle recognized the talent of the young artist who was recommended by Sirois to execute a set of four decorative panels, entitled *Four Seasons*, for Crozat's dining room. He was so impressed that he virtually adopted Watteau, setting him up in

Metropolitan Museum of Art, New York

This painting, *Mezzetin*, refers to famous 17th-century commedia dell'arte character, an amorous valet.

Schloss Charlottenburg, Berlin

Gersaint's Shopsign, said dealer Gersaint himself, was painted in just eight days, "still he only worked mornings, his delicate health or more accurately his weakness, did not permit him to work longer."

quarters in the mansion, where he stayed for a year.

It was a year of revelation. At a time when there were no public art museums, any painter who had not been to Italy knew the art of the Renaissance only through deformed versions in engravings. As Crozat's guest, Watteau lived in the presence of paintings now in the Louvre and, as well, had access to the collections of Crozat's friends. Giorgione and Titian, the great Venetians, became his teachers by example. Their colorism, cooled down in general tonality, and their poetization of sensuous experience, reduced in intensity and heightened in intimacy, became the bases for Watteau's *fêtes galantes,* those gentle celebrations of love where small figures in shimmering fabrics stroll or rest or listen to music on the lawns of wooded parks.

The amorous tone that Watteau introduced was normally one of respectful courtship rather than the byplay of seduction, and was apotheosized in the *fête galante* at its purest, even most chaste, terms in his undisputed masterpiece, *The Embarkation for Cythera*—undisputed, that is, except for disagreements as to which of the two versions in which it exists is the first or better (the one shown here, pp. 64-65, is in Berlin; the other is in the Louvre). There is dispute also as to whether the original title, *Pèlerinage à l'isle de Cithère,* which can be interpreted either way, means that the pilgrims are embarking for Cythera, the legendary island of love where Venus was born from the foam of the sea, or returning from it.

Watteau is usually and most easily thought of as the great painter of Louis XV's mid-18th-century France, the very paradigm of all that was best in a style of sensitive artifice coming after what was worst in the pomposity of Louis XIV, and finally yielding to the rigid classicism of the immediately pre-Revolutionary years under the unhappy Louis XVI. Actually—chronologically that is—Watteau was a modernist out of key with the official art of his times, which was that of Louis XIV's old age. Patrons like Crozat and his rich associates were comparable to the early collectors of Impressionism during the days 150 years later when Monet and Renoir were being persecuted as esthetic deviates by the Academy, or to those who collected Matisse and Picasso in the early 20th century when Fauvism and Cubism were inexplicable aberrations for most people.

The French Academy in the early 18th century, while not as ingrown and tyrannical as it became in the 19th, followed the set rules by which painters were elected to membership in rigid categories headed by "history painting," with lesser categories in landscape, portrait, still life and genre painting, the latter con-

Art critic and author John Canaday wrote last about the Pre-Raphaelites in the November 1983 issue.

cerned with realistic presentations of daily life. Watteau fitted in nowhere. Not even by stretching definitions could his *fêtes* be classified as subjects from daily life. Realistic in detail, in conception they were more like theatrical fantasies. Even the costumes, which could be mistaken for those of the day, belonged to fixed characters in the popular theater who were identified by set modes of dress.

Watteau had little respect for official painting and less interest in election to the Academy than any normal painter should have had. In his lean days he had competed unsuccessfully, painting an assigned Biblical subject, for the Academy's Prix de Rome, a fellowship that would have supported him for a period of study in that city. But now he was doing well enough as it was, had no pressing need for the wider market that election to the Academy would insure, and presumably no interest in the prestige of being able to sign his name Academician or Painter to the King. But Crozat and his influential friends felt otherwise, and managed to assure Watteau's election if he would complete the required presentation piece with a subject of his own choosing under a classification created for him: Painter of *Fêtes Galantes.* Watteau accommodated these considerable concessions on the part of the Academy by painting a large (for him) canvas—*The Embarkation for Cythera.*

The title is thought to be a reference to a successful play by the actor and author Florent Dancourt called *Les Trois Cousines,* which ended with a ballet and song translatable in part as "Come with us on a pilgrimage to the island of Cythera, whence no young girl will return without a lover or a husband," but there the connection between play and painting ends. *Les Trois Cousines* was a comedy of manners aimed at the risibilities of the box office; Watteau's painting is his sublimation of an ideal love that was never fulfilled in his own life.

Similar transmutations of popular theatrical subjects into poetic reveries are a steady component of his

Pierpont Morgan Library, New York

Pierpont Morgan Library, New York

Feathery delicacy of line which can evoke an entire atmosphere is evident in chalk *Temple of Diana.*

Seated Young Woman, chalk in black, red, white on cream paper, achieves poetic reverie he was noted for.

Musée du Petit Palais, Paris

Study Sheet with Nine Studies of Heads, in chalk on gray-brown paper, was used by Watteau for several paintings. The drawings exhibit many of the artist's qualities in line, precise observation and volume.

art. When architecture is included in the setting for a *fête galante,* it is as decorative and insubstantial as a stage set. The Italian commedia dell'arte and the French performers who followed their style, even the bawdy and scatological buffoons descended from them who performed in the streets—all the ingredients of stylized popular comedy with ancestry as far back as antiquity in Roman satires and burlesques—were raw material for Watteau in his construction of a world that for all its fashionable surface, for all its "modernism," was imbued with a timeless poetry. Even in the painting where he comes closest to pure genre, his shop sign for the dealer Gersaint (p. 61), the scene is staged as if for a theater audience. The shop's street wall has been removed so that we look into the usual three-sided stage interior, a shop where ladies, gentlemen and attendants are grouped and posed with a good director's sure eye for the creation of mood—in this case a poetic mood, a kind of indoor *fête galante,* hardly that of a commercial establishment.

Watteau's friends among painters, actors, dealers and collectors served him as models, posing for the *fêtes* in shabby theatrical costumes from his collection, which he spruced up in the paintings. The name of the model for *Mezzetin* (p. 60) is unknown. Mezzetin was a stock character in the commedia dell'arte, a short fellow ("mezzetin" means half-measure, or as we might say, half-pint) whose function was to act as confidential agent for other characters, while in his own life he was constantly being frustrated in his sentimental pursuit of love. It is tempting to identify this Mezzetin with Watteau himself. His eulogists described him as of medium height, which might have been a euphemism for short, and near the end of his life, when *Mezzetin* was painted, he realized that as a lover he was defeated.

It may be that we read into Watteau's paintings a degree of poetic spirit beyond what he intended or was sensed by his contemporaries. For him and his friends, familiar with Parisian actors, traveling companies and perhaps private performances of dubious gentility, there must have been explicit theatrical references requiring no explanation at the time in paintings where we can only sense an aura of the theater with a consequent air of poetic mystery. The most inscrutable of his several paintings of traditionally-costumed actors is the great *Gilles* (p. 58). In the first place, the char-

acter presented cannot be Gilles. The misnomer was given the painting upon its rediscovery in the 19th century, when Gilles and Pierrot share the same costume. The latest scholarly style is to title the picture *Pierrot (*called *Gilles).* When Watteau painted the picture, the costume was exclusively Pierrot's. Gilles wore a costume on the order of the Fool and, although sometimes pressed into service in the role of deceived husband, was more acrobat and tumbler than actor—sometimes a tightrope walker—in the acrobatic performances that preceded the spectacle proper.

Watteau's monumental figure is in Pierrot's costume, but on the other hand, his face is not whitened as Pierrot's was at that date, and the personage—this is irrefutably a portrait—wears the costume rather awkwardly as he towers above the figures behind him who are at ease in their roles. Who is the subject, that he should be so exceptionally portrayed? Was there some personal or professional symbolism to account for so unlikely a man assuming the role of Pierrot, the fragile moonstruck lover (and habitual loser), in an exceptionally large and strong painting? If we had explanations, would the painting lose its mesmeric presence?

Gilles is a late Watteau in a sharpened, solidly realistic style that, if he had lived and continued it, would have marked off his presently existing work as the product of a developmental first period instead of a lifetime achievement. The *Gilles* is larger than *The Embarkation for Cythera,* and the figure itself is by several multiples the largest that Watteau is known to have painted.

A magnificent painting but out of key with the rest of his work, the *Gilles* raises an unsettling question as to just how much we really know about the man who painted it. In spite of what seems a full chronological calendar of his life, most of what we think we know about his character we have deduced (as in this article) on the assumption that the melancholy undercurrents of the *fêtes galantes* were a spontaneous expression of the mood of his life. There is also a chance that we have done exactly what his friends who wrote about him after his death wanted us to do: accept a doctored appreciation of the man that accords with the special character of his art.

Two of Watteau's eulogists express in almost identical terms, as if they had compared notes, a salient aspect of his personality which, if true, should interest post-mortem psychological analysts. The Comte de Caylus, a nobleman, soldier and amateur of the arts who delivered a biographical eulogy at the Academy, said that *"La pureté de ses moeurs lui permettoit à peine de jouir du libertinage de son esprit"* (The purity of his morals scarcely allowed him to enjoy the freedom of his spirit), and the art dealer Gersaint called him *"libertin d'esprit, mais sage de moeurs"* (libertine in spirit but wise in conduct). The businessman and collector Jean de Jullienne, a man of Watteau's own age, a friend since their earliest 20s and second only to Crozat in wealth and sponsorship until

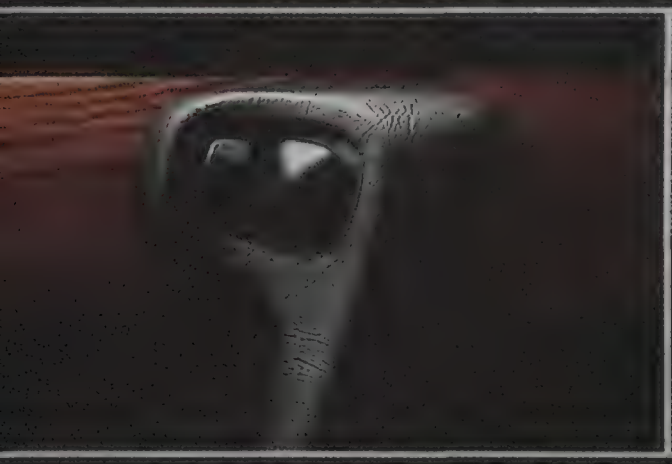
Schloss Charlottenburg, Berlin

A paradisal scene inhabited by angels and happy, elegant people forms *The Embarkation for Cythera.*

Watteau's death, put together a catalog illustrated with engravings, the nearest he could come to a definitive list of all Watteau's paintings—the *Recueil Jullienne*—but omitted a few he thought erotic. And we are told that just before he died Watteau destroyed similar paintings and drawings. In view of the currency of salacious and libidinous drawings and paintings and prints at the time, Watteau's (there *are* a few existing ones) were mild; the question really is why his reputation had to be protected from them—unless the idea was to enhance the poetic image that, indeed, has persisted.

It has been a little sentimentalized, this image; the touch of irony that tempers it has too often gone unperceived. Watteau the man continues to elude all efforts to reconstruct a real person, but perhaps that is not too bad. The loss of the synthetic personality we identify with his paintings might be too great.

THE LUXURY CAR FOR THOSE WHO REFUSE TO RELAX THEIR STANDARDS.



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THE ULTIMATE DRIVING MACHINE.

By Richard L. Williams

Atop a 'little mountain' in Virginia, Jefferson cultivated his botanical bent

Our third President was a passionate planter; now his beloved gardens at Monticello are being magnificently restored to full bloom

Monticello/National Portrait Gallery

When Gilbert Stuart painted him in 1805 Jefferson was President—but he did not neglect his gardens.

When Thomas Jefferson was a young law clerk he enjoyed striding about the Virginia hilltop his father had bequeathed to him, thinking grandly of the fine home and gardens that he would someday create there. He had not yet been to Italy, but already he had in mind the idea of christening the place Monticello and pronouncing the "little mountain" *montichel'lo* in the Italian way. It took Jefferson the better part of 60 years to make his dreams come true, mainly because he had so many distractions to contend with—as author of the Declaration of Independence, as American Minister to France, as George Washington's Secretary of State, as a two-term President of the United States and as founder of the University of Virginia.

Jefferson was the quintessential man of many parts. It was his formidable intellect that enabled him to accomplish so much in public life. His superb architectural sensibilities were responsible for the elegant innovations of the mansion that he built at Monticello. But it was a lesser-known attribute, his green thumb, that accounted for the splendid horticultural accomplishments that were on display at Jefferson's estate—broad lawns, glorious flower beds, innovative orchards and vineyards, and a spectacular vegetable garden that was longer than three of today's football fields placed end to end. In addition to all of his other extraordinary gifts, Thomas Jefferson was one of the most inventive gardeners of his time.

Viewed from a brilliant bed of golden marguerites, mansion at Monticello looks more like a doll's house.

Cultivating the soil was not just a hobby with Jefferson; it was a passion. "I am become the most *ardent* farmer in the state," he proudly announced in middle age. As an old man, he wrote to his longtime friend, the artist Charles Willson Peale, that "Under a total want of demand except for our family table, I am still devoted to the garden. Though an old man, I am but a young gardener." In the same letter he told the painter that "No occupation is so delightful to me as the culture of the earth, and no culture comparable to that of the garden. Such a variety of subjects, some

Photographs by Robert Llewellyn

In aerial view of Jefferson's horticultural world, the planter's penchant for symmetry is plain to see.

His telescope stands between geraniums, more luxuriant than Jefferson grew, and his microscope.

one always coming to perfection, the failure of one thing repaired by the success of another, and instead of one harvest a continued one through the year."

Sadly, Jefferson was more than $100,000 in debt when he died in 1826 and his heirs had to abandon Monticello and its gardens to the ravages of time and neglect. But now, almost two centuries after he first laid admiring eyes on the great estate gardens of England, the foundation that bears Jefferson's name is restoring the ones he designed and planted at Monticello. The ambitious project is more than a dramatic lesson in horticultural history. It serves as a living testimonial to Jefferson and a celebration of his well-known preference for the rural life. He was, after all, the Founding Father who fervently believed that cities are "pestilential to the morals, the health and the liberties of men."

In its complexity, the garden task is as challenging

Roads that he called "roundabouts" encircled estate. A long, narrow vegetable garden spans top of picture.

as the restoration and refurnishing of the mansion itself, which has been going on for 50-odd years (SMITHSONIAN, June 1973). Several people are in charge of the project. One is William L. Beiswanger, architectural historian of the Thomas Jefferson Memorial Foundation, which owns Monticello and derives most of its income from the $4 admission fee paid by a half-million visitors each year. Beiswanger's role is to come up with new restoration ideas and coordinate the work to be done on them. Resident archaeologist William Kelso is assembling evidence on the precise locations of the gardens and buildings that Jefferson supervised at Monticello. Horticulturist Peter Hatch, the gardening superintendent, must decide which variety of fruit

Contributing Editor Richard L. Williams wrote about the common cold in December 1983. His article on earthquakes appeared a year ago.

Tulips now bloom in the spring along serpentine walk where Jefferson put border of ten-foot flower beds.

tree, ornamental tree, grapevine and vegetable Jefferson cultivated in the red-clay soil of Albemarle County. The restorers have been helped immensely by the fact that Jefferson, an almost obsessive record keeper, left voluminous notes in his *Garden Book*, his *Farm Book* and in a memorandum book that told whom he owed and who owed him. But he also left gaps in the record, so that the restoration people are sometimes on their own when it comes to deciding which species to replant, and where to plant them.

Jefferson's father had died in 1757 when Thomas was only 14, leaving him 5,000 acres of land, including the little mountain. By the time he was 28, Jefferson was a successful lawyer and apparently he had already decided that he wanted Monticello to be a kind of "ornamented farm" that combined gardens for both pleasure and practicality. This notion was subsequently reinforced by his reading and by his extensive tours of gardens in Europe. He had specific plans for his grounds, as he wrote in a 1771 memorandum: "Thin the trees. Cut out stumps and undergrowth. Remove old trees and other rubbish except where they may look well. Cover the whole with grass. Intersperse Jesamine, honeysuckle, sweetbrier, and even hardy flowers which may not require attention. Keep in it deer, rabbits, Peacocks, Guinea poultry, pidgeons, etc. Let it be an asylum for hares, squirrels, pheasants, partridges, and every other wild animal (except those of prey). Court them to it by laying food for them in proper places. Procure a buck elk, to be, as it were, Monarch of the wood; but keep him shy, that his appearance may not lose its effect by too much familiarity. A buffalo might be confined also. . . ." Much of it was done in time, and Jefferson even had deer eating corn out of his hand.

But first he had to level the top of the little moun-

Clambering up their poles, bean plants in 1,000-foot vegetable garden cast long shadows on a fall afternoon.

tain into an elliptical site for the substantial home he would build there. Eventually, the lopped-off hilltop was surrounded by four circuitous roads, or "roundabouts," used for driving or walking. They were connected by oblique roads that cut through the heavy timber. The flower beds around the main house were oval in shape, too. Beyond the house on the west side Jefferson located a lawn, surrounded by a serpentine walk: More flower beds, divided into ten-foot sections, bordered that walk.

Granpapa's fling with the flowers of spring

Jefferson's granddaughter, Ellen Randolph Coolidge, recalled his affection for Monticello's flowers in a letter written some years after his death: "I remember well when he first returned to Monticello, how immediately he began to prepare new beds for his flowers. . . . I remember the planting of the first hyacinths and tulips, and their subsequent growth. . . . Then, when spring returned, how eagerly we watched the first appearance of the shoots above ground. Each root was marked with its own name written on a bit of stick by its side, and what joy it was for one of us to discover the tender green breaking through the mould, and run to granpapa to announce, that we really believed Marcus Aurelius was coming up, or the Queen of the Amazons was above ground! With how much pleasure compounded of our pleasure and his own, on the new birth, he would immediately go out to verify the fact, and praise us for our diligent watchfulness. Then when the flowers were in bloom, and we were in ecstasies over the rich purple and crimson, or pure white, or delicate lilac, or pale yellow of the blossoms, how he would sympathize in our admiration. . . ."

The horticulturists who are restoring the gardens at Monticello cultivate the species that Jefferson knew about, such as four-o'clocks, rather sparse and leggy ageratum and the Columbian lily (*Fritillaria pudica*) that Lewis and Clark brought back from their Western expedition. In the interests of authenticity, they avoid using flowers that had not yet been developed or imported from Asia, South America and Africa, such as the hybrid delphinium or petunia.

The mansion at Monticello, famous for the kind of restless ingenuity that was Jefferson's trademark, is thought to be the first domed structure in America. The main hall contained Jefferson's great clock, with its descending weights marking off the days of the week. In the dining room Jefferson's system of dumbwaiters enabled guests to receive wine without being interrupted by servants. The same penchant for creative problem solving is exhibited in Monticello's grounds and gardens. The cisterns that augmented the water supply from Monticello's undependable well are

A restless experimenter, Jefferson tried producing many different varieties of vegetables. Modern harvest includes striped citron melons, cranberry beans (lower left), tomatoes, West Indian gherkins (lower right).

of Jefferson's own design. So is the oval pond that he installed as a holding tank for edible fish and also, possibly, as a sometime reservoir for garden water. The pond was located near the southwest pavilion, which was built as his bachelor quarters. Here he and his bride, the former Mrs. Martha Wayles Skelton, spent their first night at Monticello in 1772.

Not far from this pavilion, but out of sight of the mansion, was the plantation village Jefferson called Mulberry Row. Situated beside a thousand-foot stretch of roadway planted with mulberry trees, the row consisted of at least 19 buildings, including slave quarters, the nailery, the joinery and the blacksmith shop. Almost to the very end, Jefferson hoped that some of those enterprises would help Monticello become self-sufficient and thereby ease his burden of debt, but they never did. Today, in an effort to learn more about slave life in Mulberry Row, Kelso and his workers are looking for archaeological evidence where the buildings once stood. They have gathered up hundreds of nails from the nailery, and they have patiently scraped and brushed the earth to uncover bits of crockery, iron tools and bones from cast-off refuse.

Just below Mulberry Row—parallel to it, in fact—Jefferson put his vegetable garden. It was every bit as long as the village roadway, and it was 80 feet wide. In it, Jefferson tried to grow more than 250 varieties—everything from Hotspur peas and a squash called "warted cymling" to tomatoes, spinach and beans. He was an up-to-date tiller of the earth, practicing crop rotation and contour plowing, and he railed against tobacco and other cash crops that exhausted the soil.

Carved right out of the hillside, the vegetable garden was supported by an 11-foot wall of uncemented stones. Many of the rough stones, some weighing half a ton and some small enough to be handled, were put to other uses after Jefferson's time. The wall was reassembled recently after students from the Monticello Field School of James Madison University and the University of Virginia excavated the original location.

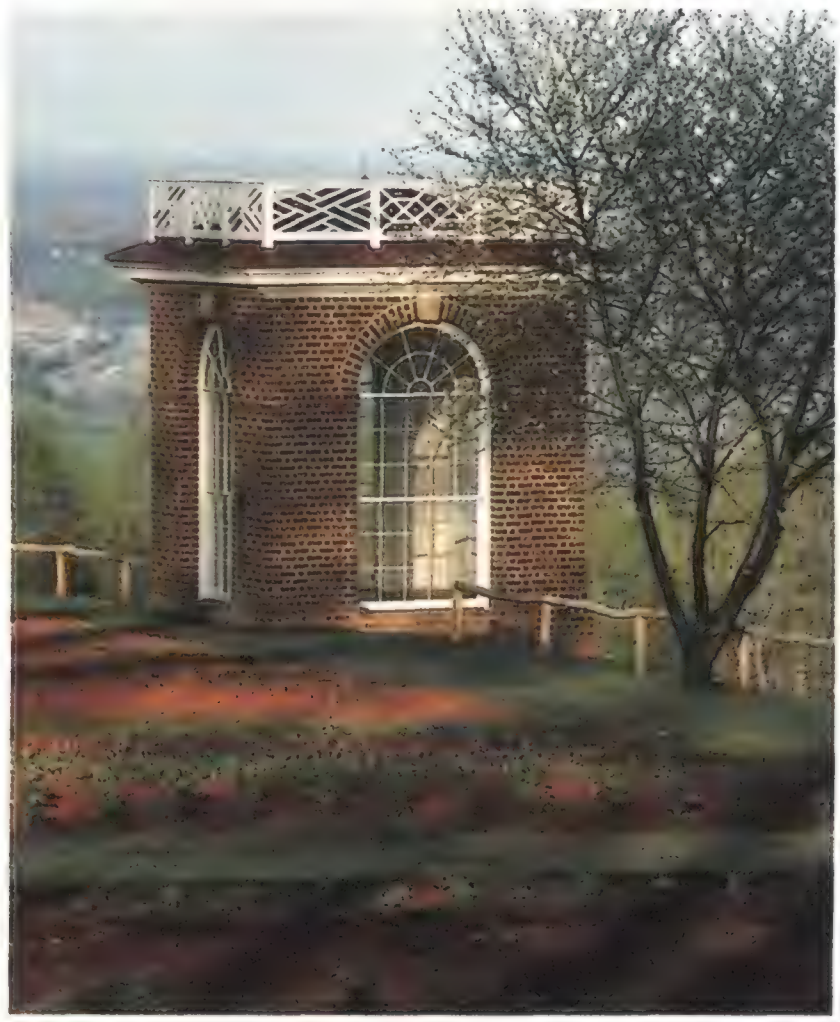
Today, dogwoods flower on the site of Monticello's north orchard, where archaeologists have been at work.

The garden, orchard and vineyard were protected from pests by a ten-foot-high paling fence of chestnut boards, overlapped and narrowly spaced so "as not to let even a young hare in." Jefferson, ever the quantifier, estimated that it would take 300 posts, 900 rails and 7,500 boards to build the half-mile-long fence. Now, the restorers cannot wait to rebuild it, for baby rabbits and other creatures keep nibbling at the crops.

Smack in the middle of the garden Jefferson erected an observation-post pavilion that he called a "temple." It was an invigorating spot to sit, read and enjoy what he called his "sea view." Of that prospect on the east side of the little mountain, one of Jefferson's visitors wrote: "The eye is not checked by any object, since the mountain on which the house is seated commands all the neighboring heights as far as the Chesapeake. The Atlantic might be seen, were it not for the greatness of the distance. . . ."

Like many of Jefferson's architectural creations, the garden pavilion idea was originally inspired by Palladio, the brilliant 16th-century Italian architect. Erected on the earth fill obtained for the garden by leveling the mountaintop, Jefferson's temple lasted only a short time, until a destructive storm knocked it down. Now it has been rebuilt on concrete foundations poured deep into the hillside (right). According to historian Beiswanger, the rebuilding of the pavilion has "established the presence of Jefferson in the garden, at the center of his horticultural world."

At one time, Jefferson thought about building several additional pavilions. Each of them would feature a distinctly different style of architecture, including, he noted, "a specimen of Chinese." But after drawing up a plan to locate the structures in the vegetable garden, he changed his mind. "[It] is not the place for ornaments of this kind," he explained. "Bowers and treillages suit that better, & these temples will be better



By excavating for evidence of fruit-tree roots, they hope to find exactly how the old orchard was planted.

Built without mortar, massive stone wall that supports vegetable garden looms as high as 11 feet in places.

Jefferson liked to relax in his garden pavilion; he enjoyed vast panorama of plains rolling to the east.

disposed in the pleasure grounds." As far as anyone can tell, the original garden pavilion was the only one that was built.

The "pleasure grounds" Jefferson had in mind involved the creation of an 18-acre "grove" on the west side of Monticello. The woods there, he decreed, were to be "broken by clumps of thicket, as the open grounds of the English are broken by clumps of trees." He pruned and thinned the forest to obtain glades and vistas and envisioned a spiral arrangement of shrubs and "setting stone" seats beside cedar trees. Nearly two centuries after he drew up a plan for planting various trees and bushes in the grove, work began on a project to recreate it.

Jefferson's orchard will bloom again

Just below Mulberry Row and his big garden, Jefferson laid out a vineyard and orchard. The trees, many of them peaches, no longer exist. With painstaking detective work and plenty of digging, however, the archaeologists have discovered old root stains that show where some of the original orchard trees and grapevines stood. "The soil is difficult to 'read' because it has so many hues of orange and red," Kelso says. "You can do it, but it takes experience." Presently, new trees are being planted in the old locations and in time the orchard will bloom and bear fruit once again.

Jefferson could never be accused of neglecting his vineyards or of being halfhearted about making wine. Over a period of years, he planted no fewer than 36 varieties of grapes. He was always hopeful that East Coast wines might someday replace those of France and Italy but, as it happened, his own production efforts were something less than sensational. Consequently, although he stored Virginia wine in the cellars of the main house, he usually ended up serving varieties that had been purchased overseas.

His collaborator in wine making was Philip Mazzei, an Italian with whom he became close friends. Mazzei was a newcomer, looking for potential vineyard land, when a mutual friend brought him to Monticello. Immediately Mazzei became close to the affectionate and irresistible Jefferson. The master of Monticello soon gave to Mazzei a 193-acre parcel of land.

During his tours of Bordeaux, Burgundy and parts of Italy when he was Minister to France, Jefferson learned a great deal about European vineyards. Later, he applied that knowledge at Monticello. When Mazzei brought over a number of Italian vignerons to work in his own vineyards, two of them worked on Jefferson's, as well. Mazzei was one of many people with whom Jefferson exchanged seeds and plants, and when the Italian died in Pisa in 1816, his old friend keenly felt the loss.

Whatever in the world did Jefferson *want* with all of those fruit trees and grapevines and vegetables? Well, for one thing, he was an avid botanist and liked to experiment with seeds from all over the Eastern states, from Europe and from the Lewis and Clark expedition. For another, he was a generous host and family man. The 14 bedrooms at Monticello were often filled with children and guests who had to be fed.

Jefferson was a most persistent hunter-down of new seeds and plants. While he was Minister to France, for example, he took a three-week trip through the Piedmont rice lands of Italy. Though the penalty for exporting any of the Piedmont rice was death, he smuggled some grains out of Italy in his pockets.

Monticello horticulturist Peter Hatch has certainly had his work cut out for him by Jefferson. Thus far the ever-experimenting garden expert has located and planted hundreds of old varieties of fruit trees, vegetables and flowers; still to come are more than ten varieties of roses. Six of the trees that were living in Jefferson's time are still there: a sugar maple, two tulip poplars, a red cedar, a European larch and an American elm. Two of them had to be identified by boring into their trunks, extracting a cross section and counting the rings of annual growth. Hatch believes that about half of the fruit trees known to Jefferson are still obtainable, but many of the vegetables grown in those days are not. Soon he hopes to plant with the season of 1812 in mind; that was the year when Monticello's gardens were at their height of grandeur, and when Jefferson arranged his vegetables so that the root crops were all together, as were the leafy vegetables and the fruiting ones such as peas and beans.

Partly for the sake of his numerous grandchildren, Jefferson tried to avoid planting anything poisonous. In 1813 he turned down an offer from Dr. Samuel Brown, an amateur horticulturist, writing that "I have so many grandchildren and others who might be endangered by the poison plant, that I think the risk overbalances the curiosity of trying it. The most elegant thing of that kind known is a preparation of the Jamestown [jimson] weed, *Datura stramonium*, invented by the French in the time of Robespierre. Every man of firmness carried it constantly in his pocket to anticipate the guillotine. It brings on the sleep of death as quietly as fatigue does the ordinary sleep, without the least struggle or motion. . . ."

Visiting Monticello today, you feel at every moment the presence of the man who designed it. Jefferson liked to say that "the earth belongs to the living" and it almost seems as if he takes each visitor by the hand and proudly shows off what he has wrought. Strolling along the serpentine path among his flowers, or seeing the trim green lines of his spring-bright peas, or catching the magic of his sylvan glade, we know that Jefferson *loved* his garden. We can picture his hands curved in anticipation of fondling a full-blown peach, and we can think along with him as he records in his garden calendar the changes he is planning to make under the bright summer sun—knowing that he writes in the chill of a January rain.

After a shower, birds congregate on Monticello walk amid summery blooms—just as Jefferson intended.

In Monticello, we can sympathize with Jefferson's preference for the American climate, compared to what he had experienced abroad. As he told one friend in France, "I think it a more cheerful one. It is our cloudless sky which has eradicated from our constitutions all disposition to hang ourselves, which we might otherwise have inherited from our English ancestors."

We can imagine the master of his little mountain riding around almost daily, checking all of his ventures, always maintaining a cheerful view—even when the ventures turned into disasters. There was always next season, when this bush might be moved or that new seed could be tried or the vineyards might yield good wine—that eternal renewal of hope that every gardener who has ordered seeds from a catalog knows so well. Jefferson's joy in another gardener's successes, the seeds he kept sending to friends, speak so eloquently of his commitment that we gain a new insight into his character. His idea of the perfectibility of a house or a garden or a person becomes part of a whole. It is a gracious ideal and one he spent a full lifetime working to achieve, loving it all the way.

A ball remains suspended above coil of wire even when wires supplying current are disconnected (left). Cooled in liquid helium to almost absolute zero, wire is superconducting; current will flow forever.

By James S. Trefil

Magic trick moves out of the lab and into our everyday lives

When metals get cold enough they become superconductors and strange things happen; some surprising applications are in store

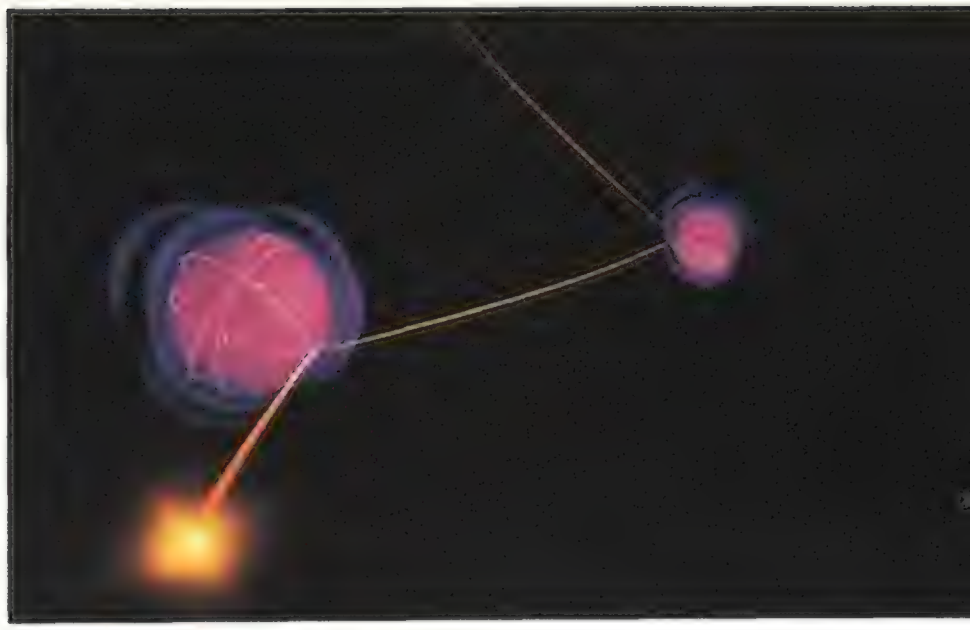
It's almost like an old-time magic show. The physicist throws a switch, sending current from a battery through a ring of niobium wire in a transparent glass container. Immediately, a lead-coated ball resting on the wire jumps into the air and stays there, floating without any visible support. Then the physicist opens the switch, stopping the flow of current from the battery. The ball stays suspended. Next, to prove that there is nothing up his sleeve, he disconnects the battery and takes it out of the room. The ball doesn't move. It remains floating, defying gravity even though no energy is being put into the system.

Far from being magical, however, the floating lead ball is a demonstration of the power of a phenomenon that is likely to make a major impact on technology and on your life during the next decade. It is superconductivity, a property of certain metals by which they can carry electrical current without any measurable loss when they are maintained at very low temperatures. In our demonstration, the battery starts currents flowing in the niobium ring and the lead ball. Once the currents are there, the fact that both the niobium and the lead are superconductors means that the currents will continue to flow and the battery which was needed to start them going becomes superfluous. That's why it could be disconnected and removed from the room without changing anything. (For a graphic representation of what happens, see pages 80-81.) For the effect to work, both metals must be kept at very low temperatures. In this case, they were immersed in liquid helium. Helium is normally a gas, but like most other gases it becomes a liquid if it's cold enough. "Cold enough" in the case of helium means four degrees above absolute zero. This translates into –269 degrees C or –452 degrees F.

The phenomenon of superconductivity is not a new and revolutionary discovery. It was first seen in 1911 in a sample of metallic mercury. It was understood theoretically during the 1950s, as we shall see. What is new and exciting about superconductivity today is that it has moved from being a laboratory oddity to the point where it is poised on the brink of becoming a major commercial enterprise. As such, it may play a major role in fields as far apart as oil prospecting and mass transportation. A few audacious thinkers have even plotted out a major role for it in the exploration of space and the colonization of the moon. My own impression, after talking with many of the people directly involved in developing the new technology, is that superconductivity now stands in much the same place that solid-state electronics did in the mid-1960s. No one then could have foreseen the tremendous impact that miniaturized electronics would have on the American economy. In just the same way, the most important consequences of the advent of superconductivity are most likely to be in areas that no one today is able to anticipate.

Basically, work in superconductivity can be broken down into two separate fields. Some applications will involve very large-scale projects such as high-speed trains. Others will work at the far end of the spectrum, in tiny detectors and miniaturized electronic circuits. Backing up both of these commercial efforts is research designed to discover new and better superconductive materials. As a university scientist, what strikes me most forcefully about the field is the closeness of the ties between industry and academe. Except for the

Normally, electrons in an electrical current collide with atoms in the metal and lose energy, as in the first picture at right. At temperatures near absolute zero, however, the situation changes. In the second picture an electron (which has a negative charge) moves between two atoms (which have positive charges). The atoms begin to move toward it, but by the time they respond the electron is gone, and the atoms now form a concentration of positive charge, attracting a second electron which becomes paired to the first. As the free electrons bond into pairs, the metal becomes superconducting. The pairs themselves lock together, and the massed electrons (third picture) simply ride roughshod through places in the metal where a lone electron would be slowed.



absence of students, there is nothing to distinguish the research labs at a place like Westinghouse from those in the basement of any university physics building.

The aspect of superconductivity most likely to have a direct impact on your life is in the manufacturing of large magnets. Magnets are not an obvious part of our daily lives, but it would be difficult to go very long in our modern society without using something that has a magnet in it. The switch that lets water into your washing machine, the blender and mixer in your kitchen, your car, radio, TV and even the buzzer on your door make use of magnets to do their job. This widespread use of magnets is hard for us to see because the magnets in all of the devices mentioned (and in many more) are not the blocks of metal that you see in toys or little gadgets made to hold notes on your refrigerator door. Those pieces of metal are permanent magnets, requiring no action on our part to display their magnetic properties. It is electromagnets, however, which are all around us. This kind of device, like the loop of niobium in our demonstration, displays magnetic properties only when an electrical current is flowing through loops of wire. In your washing machine, for example, current flows through an electromagnet that pulls an iron plug out of the water inlet, allowing the water to enter the tub. When the timer turns the current off, the plug goes back into place and the flow of water stops. So long as a current is flowing, the loops of copper wire in your washer behave in exactly the same way as an ordinary iron magnet.

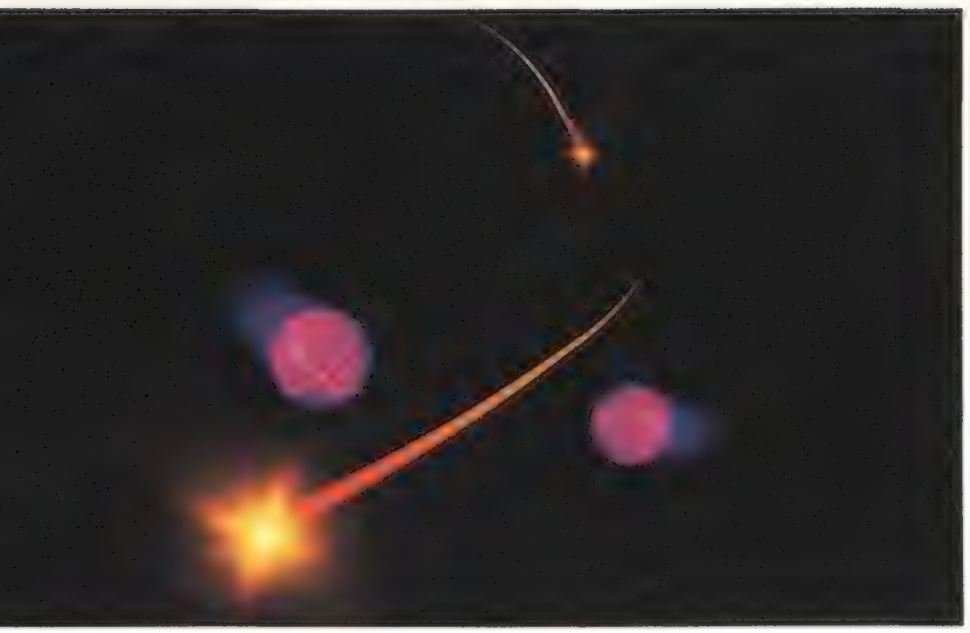
It is this fact that holds the key to the use of superconductivity in electromagnets, for once a current starts to flow in a superconducting wire loop, it will continue to flow without the need of an energy source to keep the electrons moving. This means that so long as the magnet is kept cold, it will perform its function without drawing any electrical current—no small advantage in this day of sky-high energy costs. Small superconducting magnets have been used for many years in scientific laboratories, as have single, custom-built large magnets.

The world's largest collection of superconducting magnets is already in place and functioning at the Fermi National Accelerator Laboratory near Chicago. There, powerful magnets guide protons along a track almost four miles around. At intervals around the ring, electrical forces are applied to speed up the particles until, after more than 100,000 revolutions, they emerge traveling at almost the speed of light. There are 1,000 magnets in the ring, all of the conventional copper-wire type, and just keeping them going requires a great deal of electrical power. When the machine was started up in the early 1970s, lights did not dim all over the state, but 100 miles away physicists in laboratories at the University of Illinois could detect with their instruments a small flickering in the area's power supply whenever the magnets were turned on.

Even as this enormous project was being completed, it was clear that it would have to be upgraded if the United States was to remain in the forefront of high-energy physics research. It was also clear that simply adding more conventional magnets to the system would be prohibitively expensive. For various reasons, it was not possible to do official design studies, but a group of people calling themselves the Underground Parameter Committee began to meet and think about how a superconducting machine could be built.

That may seem like a strange way to build a multi-million-dollar machine, but it worked. The machine

Dr. Trefil has received the American Association for the Advancement of Science-Westinghouse award for science writing for his series on the birth and death of the Universe, SMITHSONIAN, *May-June 1983.*



was designed and funded, adding a second ring of magnets to the accelerators. This ring was located directly under the original ring, in the same tunnel, and was completely superconducting. The problem facing the builders was to fabricate about four miles' worth of superconducting magnets, which would require enough wire to reach all the way around the Earth. No one had ever before tried to fabricate that much superconducting material for one project.

Wires of a special alloy of niobium and titanium were assembled into cables about a quarter-inch across. At Fermilab the cables were taken to a large metal building that had been converted into an assembly line, where they were wound into the correct form for the magnets. The new magnets were then tested and loaded on trailers hitched to an old farm tractor to be pulled the last mile or so to the main accelerator for installation. At its peak of production, between 350 and 400 people were working in the factory, and each magnet required about one-half man-year of labor to complete (p. 82). Richard Lundy, who was in charge of the operation, put the cost another way. "Each magnet," he said, "is equivalent to a new Mercedes." Lundy is a car enthusiast; to visualize almost 1,000 new cars parked around the four-mile circumference of a circle is a good way to think of the cost of the project.

In any case, in March 1983 the lab held its "last magnet party"; in August the first beam came through the new upgraded accelerator, and in November physicists began experiments using the world's largest installation of superconductors.

If basic research is the largest user of superconducting magnets at the moment, it may soon be eclipsed in that role by a new technique in medical diagnostics, nuclear magnetic resonance, known as NMR (SMITHSONIAN, January 1984). The idea is to place a patient in an intense magnetic field and then, using sensitive detection techniques, measure the effect that the field has on the nuclei of the atoms in the body (p. 86). These measurements are then fed into a computer which uses them to construct a three-dimensional picture of the patient's internal organs. Enthusiastic proponents of this technique talk about installing a thousand units a year in hospitals around the world.

Looking further into the future, other uses of the superconductive magnets become visible. One is in the field of high-speed ground transportation. At this moment, the maximum speed a train can achieve is governed by the friction between its wheels and the rail. With carefully built track, it is possible for trains such as the French TGV (*train à grande vitesse*) to achieve a maximum speed of close to 230 miles per hour—a figure that engineers reckon to be about the best that can be achieved with present methods. But what if we do away with the wheels altogether? Suppose that instead of supporting the train on wheels, we support the train with magnets? If, for example, we had a powerful magnet in the train and a metal track under it, there would be magnetic forces operating that could easily lift the train slightly off the ground, permitting it to float without wheels. In this case, wheel friction would no longer limit the speed we could achieve. Pulsing the magnets in sequence would move the train forward.

Of course, if we had to use conventional magnets to lift the train, we would have to provide the electrical current to run them, thus losing in the process any advantage gained by the absence of wheel friction. But with superconductors, all we have to do is make sure that the magnets stay cold; no power is needed to keep the train floating. This scheme is known as "maglev" (magnetic levitation). Although the United States seems to have dropped out of the race for the development of intercity maglev trains, both the Japanese

Superconductivity moves out of the lab

Colors brighten bars of a 3,000-pound press used to assemble superconducting magnets at Fermilab.

and the Germans have been working on it. Japanese National Railways, in fact, has tested full-scale prototype maglev trains (p. 89) at speeds in excess of 300 miles per hour—a speed that would allow passengers to move from downtown Washington to downtown Manhattan in less time than it now takes airplanes to travel between the airports of those two cities. Maglev clearly offers an alternative to inconvenient and overcrowded air transportation between cities a few hundred miles apart, an alternative that has the advantage of being much more energy-efficient in the bargain.

Finally, if we want to look much further into the future, Gerard K. O'Neill, a physicist at Princeton University, has proposed that Man's move into space might be greatly facilitated by the use of a device he calls a "mass driver" (SMITHSONIAN, February 1976), which could use superconducting magnets. The idea is that instead of using inefficient rockets to lift payloads into space, the payload is placed in an open-ended, bucket-size container that includes a magnet (p. 84). The container is then levitated and driven through the magnetic coils of the cannonlike mass driver. If the mass driver is located on the surface of the moon, there is no air resistance, so the container can be accelerated to very high velocities, high enough to allow the payload to escape from the moon's gravitational pull. At the last moment, the container is decelerated. The payload keeps going, flying off into space where it will be caught and used to build machines and habitats for humans. The bucket, meanwhile, curves around and returns to its starting point on the moon.

Plastic payloads reach escape velocity

Prototypes of mass drivers have been built, and small plastic cubes have already been accelerated to speeds in excess of seven miles per second, enough to allow them to escape from Earth. Enthusiasts of this technology dream of the day when it will be cheaper to send a pound of material into space from Cape Canaveral than it will be to mail the same pound of material to New York City.

Turning our attention from the large-scale uses of superconductivity to the small, we find the same ferment and excitement surrounding the use of superconducting devices in the realm of microelectronics. The basic element used in this field goes by the unlikely name of SQUID, an acronym for "superconducting quantum interference device." Stripped to essentials, a SQUID is a loop of superconducting wire that is broken on opposite sides by a very thin layer of insulating material. According to our usual ideas, these insulating gaps would block the flow of electrons in the loop. No current would flow because, in effect,

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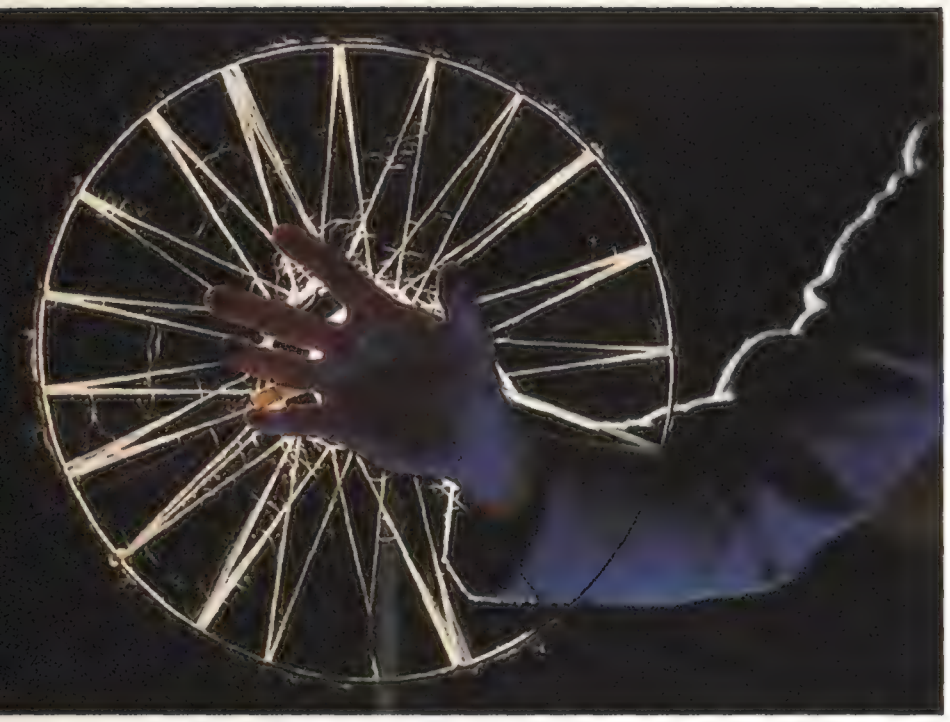

Spoked container is magnetically accelerated to high speeds at the Space Studies Institute at Princeton.

Curt Dunham adjusts magnetic "gun" being developed by the Army; superconductivity could improve it.

there are two open switches in the circuit. But the world of subatomic particles—the world of the quantum—does not always operate according to our intuition. In this case, provided that certain conditions are met, electric current of both the normal and superconducting variety can move across the gaps (in a process called "tunneling") so that the loop will behave like an ordinary superconductor. The insulating gap imbedded in a superconducting wire is known as a Josephson junction, after Brian Josephson, the British physicist who, as a Cambridge graduate student in 1962, first worked out a theory of their properties.

It is the special conditions necessary for the operation of a SQUID that make it interesting. It turns out that if the current through the SQUID exceeds a certain critical value, a voltage develops across the junctions. In effect, the junctions act as switches for turning the voltage on and off—but as switches that operate on a time scale of a trillionth of a second. The short switching time makes these devices very important in computer technology, as we shall see.

In addition, if a SQUID is placed in a magnetic field, the voltage of the current flowing through it changes in a characteristic way depending on the strength of the field. For various technical reasons, it turns out that the SQUID is far and away the most sensitive way of measuring magnetic fields.

Some of the uses for sensitive magnetic measurements are obvious. We know, for example, that the brain continuously emits the electric signals that are measured to produce an ordinary electroencephalogram. Using SQUIDs, scientists around the world are developing the techniques needed to produce magnetoencephalograms, the corresponding result for the magnetic part of the brain's output. The hope is that this extra bit of insight into the brain's operation will prove useful to the physician trying to diagnose difficult cases.

Using a SQUID to hunt under the Earth

One of the most commercial uses of the SQUID to date is in prospecting. I talked to John Clarke of the University of California, Berkeley, one of the pioneers in this field and a man often referred to by his colleagues as "Mr. SQUID." The basic idea behind prospecting with the SQUID—a subject Clarke prefers to call "magnetotellurics"—is that the surface of the Earth is continuously being bombarded with electromagnetic waves. These waves originate from a number of sources (solar storms, for example). They are reflected when they hit the Earth's surface, with the details of the reflection depending crucially on the properties of the material under the surface. These waves can give information about what exists any-

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A cat is the patient in test of diagnostic ability of an early nuclear magnetic resonance machine.

where from 150 feet to six miles underground—an oil deposit, perhaps, or a hot-water reservoir with potential for thermal-energy production. The reflected waves are very weak, of course, so only a SQUID would be sensitive enough to measure their magnetic component (p. 88).

Superconducting devices are also tools in the race to build the next generation of computers. By clever design, our best present computers have achieved a cycle time—the time required for a chip to complete one step needed in an operation—of about ten-billionths of a second. Any decrease in this number will result in an increase of the performance of the computer. Computer designers trying to achieve lower cycle times, however, run into a simple fact of life: signals inside a computer travel from one part to another at less than the speed of light, and light travels about a foot in a billionth of a second. To reach a cycle time of one-billionth of a second, then, millions of circuits would have to be packed into a volume not much bigger than a coffee cup.

But ordinary silicon chips have a characteristic that makes this sort of close packing difficult. Each chip heats up when an electrical current passes through it. In today's computers, heat generated in this way is roughly equivalent to the heat given off by a light bulb enclosed in a space the size of a bread box. All of that heat packed into a small system would disrupt the electric currents.

Superconducting devices are one way to bypass this problem. We mentioned earlier that a SQUID can function as a very fast switch. Because it is a superconductor, it operates at much lower temperatures, so that our coffee-cup-size computer would generate less heat than a flashlight bulb—an amount that could easily be removed from the computer by a coolant, in this case circulating liquid helium. Thus, the only limit to the size of a superconducting computer is the skill of the engineers and technicians who fabricate it.

At the moment, a consortium of Japanese companies is working hard to build an ultrafast superconducting computer. There are other techniques that are being tested to crack the billionth-of-a-second barrier as well; only time will tell which of them will be best.

Wanted: a "high-temperature" superconductor

The potential uses of superconducting technology are many. The chief difficulty seems to be the problem of keeping the material cold enough so that it remains a superconductor. Given the materials available today, that means the system must be immersed in liquid helium, a process that will keep it at a temperature around four degrees above absolute zero. This is a temperature that physicists usually call four Kelvins or 4 K. The combinations of niobium and titanium or tin that are now used will remain superconducting up to temperatures in the 10- to 18-K range; engineers use the extra margin to design a safety factor into their equipment. Nevertheless, the discovery of a "high-temperature" superconductor has occupied the dreams of physicists. High temperature in this context means a temperature high enough so that some substance other than liquid helium can be used for cooling.

The quest is partly economic. It would cost between $5 and $10 to buy a liter of liquid helium. Liquid nitrogen, on the other hand, sells for as little as six cents a liter. Throw in the fact that all of the paraphernalia needed to keep something cold—compressors, refrigerators and the like—can be much smaller if the temperature is higher, and you see that there are tremendous economic benefits to be gained.

Unfortunately, liquid nitrogen boils at a temperature of 77 K—much too high to be of any use in cooling superconductors. The world-champion superconductor at the present time, a compound of niobium and germanium, loses its superconducting qualities at only 23 K. But nitrogen isn't the only possible alternative

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Robert Miracky prepares to lower a superconducting SQUID magnetometer into the ground in Mexico.

to helium. Liquid hydrogen boils at 20 K and liquid neon at 27 K. Finding a material which remained superconducting up to 30 K, then, would give us the safety margin needed to cool with liquid hydrogen.

While finding such high-temperature materials is not a problem of immediate concern as far as the development of superconductivity goes, it does become important in the long run. Helium is a rare gas which is very difficult to extract from the atmosphere. The commercial helium being used today is actually mined —it comes mixed with natural gas from underground reservoirs. Most estimates indicate that sometime early in the next century this supply of relatively cheap helium will be gone.

The niobium-germanium superconductor that we mentioned could, in principle, operate in a bath of liquid hydrogen. However, there wouldn't be much of a safety margin, which would make engineers very nervous. This is a relatively minor drawback compared to the fact that the material itself is extremely brittle and unstable—so much so that it cannot be made into wires and worked into magnets. Thus, while the possibility of a high-temperature superconductor remains in everyone's mind, the main thrust today is toward the development of materials—if such are possible—with the right mechanical, chemical and thermal behavior in addition to being superconductors.

Any such material will have to be kept extraordinarily cold. A coolant such as liquid helium must circulate around it. A stationary object, like a superconducting computer, can be enclosed in a sealed, extremely well-insulated container called a cryostat. Superconducting magnets on a train can also be sealed in cryostats; any coolant loss can be replenished at station stops or from an on-board refrigeration system.

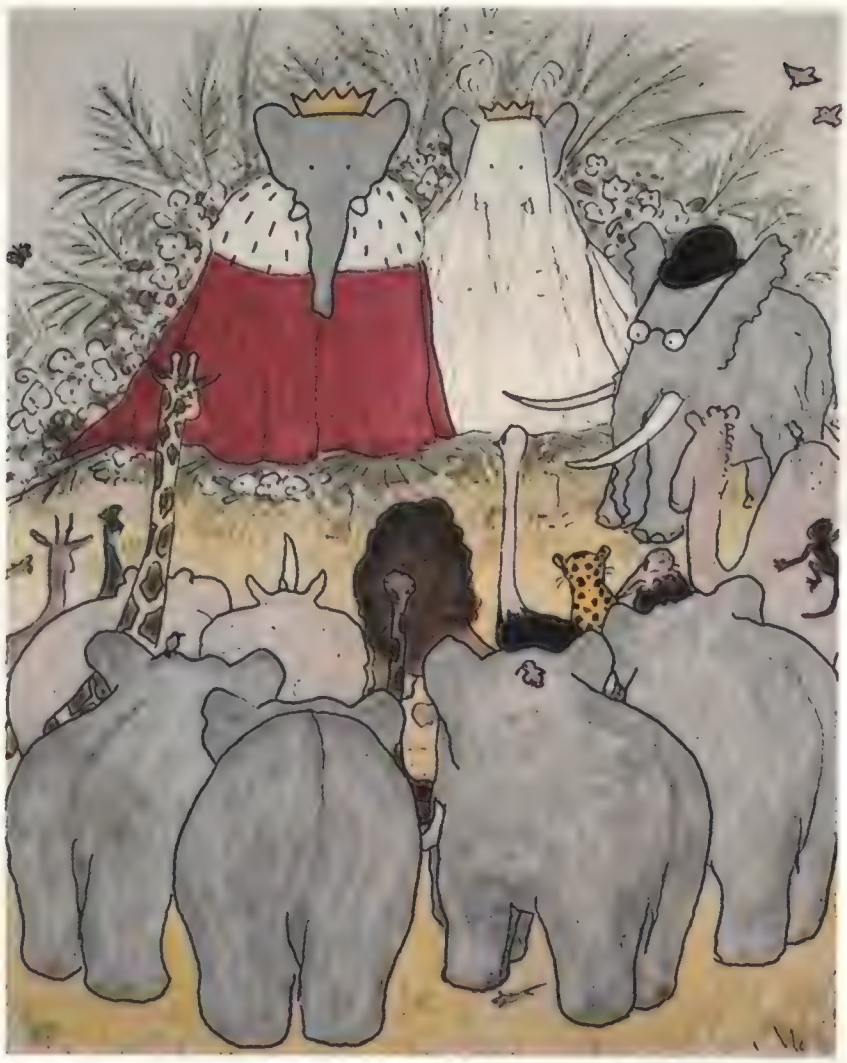
Superconductivity started out as an unexpected discovery in basic research—research undertaken for no reason other than the pursuit of knowledge. For more than half a century it remained a scientific curiosity, and only recently has its commercial potential begun to be developed. But even today, basic research remains a major driving force in the field. For example, there is a major effort to push the SQUID to the limits of its sensitivity. This effort is not directed toward any economic goal, but toward the use of the SQUID to detect gravitational radiation, a discovery of no immediate commercial value. No practical application of such radiation comes immediately to mind, but then the same was true of superconductivity back in 1911.

The Japanese have already run a prototype "maglev" (magnetically levitated) train at 300 miles per hour.

By Robert Wernick

A lovable elephant that youngsters never ever forget

Created by a French father and son, gentle Babar rules Célesteville—and countless children's hearts—as he has for a half-century



In *The Story of Babar,* new king weds Céleste; they wear finery bought in town by the dromedary.

Oldest they are and the wisest of beasts, said D. H. Lawrence of elephants. By those standards Babar is an inexperienced youth. Though he enjoys the counsel of General Cornelius, who goes back to the time of the mammoths, it is only 54 years since he was born in the jungles outside Paris.

Still, this is long enough for three generations of humans, a more volatile race, to become attached to him. You can see all the generations in the museums around the United States—San Jose this month, then Evanston, Boston, Baltimore, Toledo—through which a monumental collection of watercolors and drawings is traveling, recording every aspect of the Babarian age. Entitled "Fifty Years of Babar," it is being circulated by the International Exhibitions Foundation. Here you will see stylishly gray-haired grandmothers and trim, upwardly mobile mommies and daddies and pink-cheeked little toddlers who cannot yet read the captions. And they all have the same delighted smiles on their faces as they look at the familiar images on the walls, images of solid, gray-trunked, flat-footed Babar in the natty three-piece green suit which the Old Lady bought for him in Paris, the spats, and the crown with which he replaced his derby hat when he was chosen King of the Elephants. These are the smiles reserved for oldest friends, the ones it is a comfort and a quiet joy to see.

It all began on a calm summer evening in 1930 in a country house at Chessy, east of Paris, where a mother was telling bedtime stories to her two little boys. She told them about a baby elephant growing up in the forest, and it tickled them so much that they ran to tell Papa all about it. Papa was Jean de Brunhoff, a painter, and right away he wanted to illustrate it for them. He began to sketch the little elephant, a playful, resourceful, well-mannered little fellow much like his own sons. At first they just called him *bébé-éléphant,* until one day the name Babar came out of nowhere. Fifty years later almost everyone in the world knows the name, though there is a certain ambiguity in France where Raymond Barre, a recent prime minister who looks rather like a good-natured elephant, is sometimes called Babar.

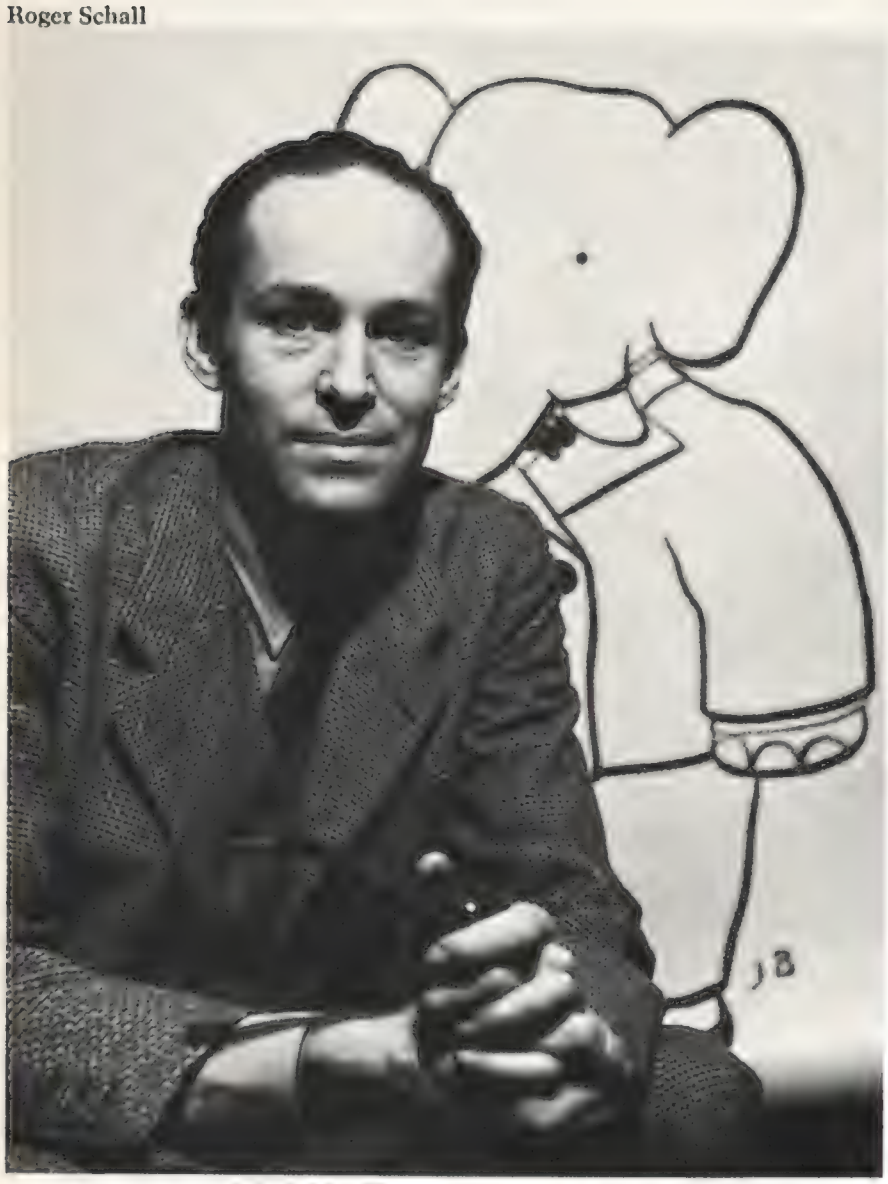
Jean de Brunhoff came from an artistic family. His father was a publisher responsible for the programs of Diaghilev's Ballets Russes, with the richly exotic blazes of color that intoxicated theatergoers of the early 1900s. Jean was a modestly successful painter whose work was shown in respectable galleries, but he never had achieved a strikingly original style. Something

Laurent de Brunhoff welcomes visiting pachyderm to "Fifty Years of Babar," now touring America.

Photographs by Chad Slattery

OF
BABAR
March 24 —— May 6

Roger Schall



In 1930, painter Jean de Brunhoff drew his first elephant to illustrate a bedtime story for his sons.

In *The Travels of Babar*, 1932, young newlyweds' honeymoon balloon trip turns into a survival course.

about his wife's gentle elephant stoked a fire in him, and he became passionately involved with his new creation. In his hands Babar grew rapidly to his full height (never great enough to frighten young readers—he reaches only one elephant-head higher than the human pedestrians when he goes strolling down the Champs-Elysées or Park Avenue) and developed an unassuming but ever dignified personality.

The pencil and watercolor sketches de Brunhoff now made took him beyond his Impressionistic paintings into an enchanted world. He pasted them up in a big spiral-bound school notebook, connecting them with a text written in the prim, cursive script taught to all French schoolchildren. His sons were delighted with the way words and pictures carried them into a wondrous world where everything seemed comfortable and homelike. Family friends shared their enthusiasm. They had never seen a children's book quite like this, so sprightly and good-humored and richly colored, with its glorious double-page panoramas full of pleasant surprises. It was published in 1931, as *Histoire de Babar*, in a huge format that a small child could crawl into. That was to remain the standard until rising publishing costs forced a smaller size in the 1960s.

The book was an instant hit. Babar became a part of every child's world in France. He traveled abroad, too. An American publisher heard about him at a cocktail party, from a woman who had picked up a copy at a French bookstore in New York. He rushed out to secure the rights and published *The Story of Babar* for what his salesmen told him was the absurdly high price of $3. Depressed America took to this stout and sturdy elephant who would never let anything get him down, and we have remained faithful through good times and bad. These days, Babar books are published in New York before they come out in Paris. (Nostalgic parents and grandparents will be happy to learn that a facsimile of the original American edition will be available this fall from Random House.)

De Brunhoff had fallen so in love with his creation

Robert Wernick, who has been a frequent contributor to SMITHSONIAN, *last wrote in these pages about the history of the pepper trade.*

After rescue from a desert island by steamer, Babar and Céleste are forced to perform in a circus ring.

Jean de Brunhoff's pen-and-watercolor study from 1930 depicts the tragic beginning of Babar's adventures.

that before the first book was published he was deep into a second. Year after year, a new title came out. But, in sad counterpoint to the warmth and optimism of the books, de Brunhoff himself, while still in his 30s, became seriously ill with tuberculosis. He died in 1937, leaving unfinished a last volume, *Babar and Father Christmas*. It had been commissioned by the *Daily Sketch* in London, where it had appeared in black and white as a serial.

Laurent, the eldest son, then 12, helped his father's brother fill in the colors for the published book. He was in high school at the war's outbreak, afterward settling in Montparnasse as a professional painter. During these bohemian years, Laurent's paintings appeared with those of other hopeful young French artists at the Maeght gallery. He was talented, painting in the graceful, muted, abstract vein then fashionable in Paris. He was devoted to his painting career, but carried with him a feeling of loyalty and indebtedness to Babar. He had, after all, been present at the birth, though he could not be certain whether what he remembered was the first bedtime story or only accounts of it he had heard over the years. Laurent had grown up with Babar, and he and his brothers took it as the most natural thing in the world that this international celebrity should be part of their family.

One day, Laurent decided to try his hand at a Babar book of his own. Since he had heard every idea grow and seen every line take shape during the years of his childhood, it was not too difficult to plunge into the style and spirit of his father. The book, *Babar and That Rascal Arthur*, came out in 1946.

If you look at this first effort with Laurent's eyes, you will see certain signs of stiffness as he tried to make his lines curl and swoop in his father's free-flowing style. But readers who acquired the book didn't notice. Babar's faithful followers simply assumed that the series had been interrupted by the war and was resuming the same as it had been before.

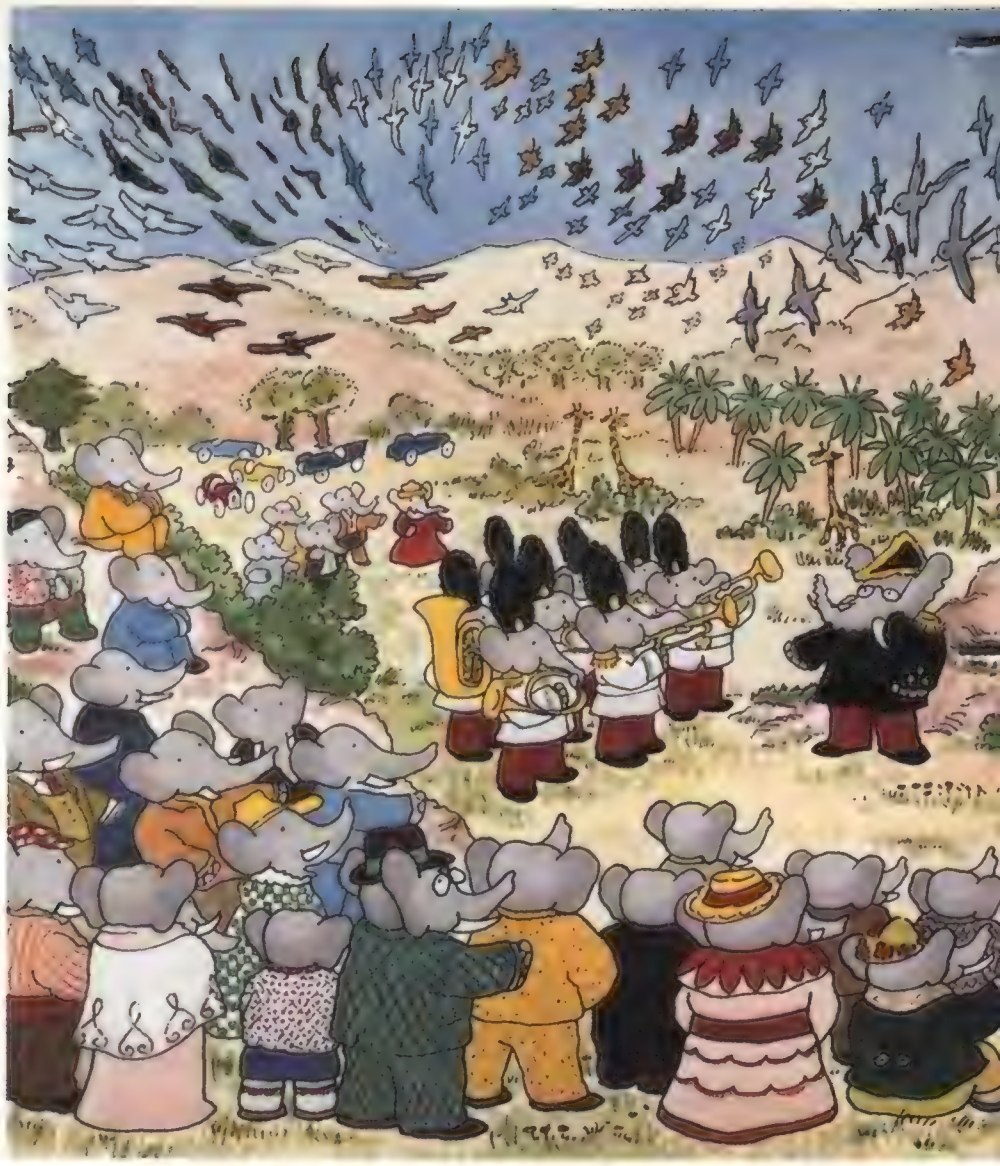
In a way, they were right. By the second or third book Laurent overcame his tentativeness, and Babar, as he says, became second nature to him. His stories are just as entertaining, with the same unpredictable but wholly natural turns as his father's. Both mix the

Fifty years of Babar's benign rule

farfetched and the familiar, elephant life and human life, with the same easy assurance. Laurent sometimes lets his fancy fly a little freer than his father ever did. His compositions are less symmetrical, often straining to soar off the page. In one scene innumerable birds flutter from the mountainside where an elephant version of Gutzon Borglum has carved a gigantic likeness of King Babar as a birthday surprise (right). He has enlarged his cast of characters to include not only lions, ostriches and ghosts but also made-to-order creatures like the Wully-Wully, accurately described by one of Babar's children as "an animal that is seldom seen," with its green fur and black whiskers and docile house-pet airs. None of these changes is significant enough to make any young reader suspect that there have been two de Brunhoffs at work. The child is always sure of getting the same old tranquil Babar, whoever the author.

Today, Laurent is tranquil enough himself. He is an intensely private person who leads a quiet life in a Paris apartment and at a home out by the great salt marshes and sand dunes of the Ile de Ré on the Atlantic coast. He and his wife, Marie-Claude, occasionally attend Paris parties and openings, but he prefers to watch birds. They have two children, both of them grown up (this sets Laurent apart from Babar, who has had three, none of whom has ever grown up). Like his father's, Laurent's family life is warm and closely knit. Babar has always been part of it. When Marie-Claude hears her husband pacing circles in his studio in Paris or his rose garden on the Ile de Ré, she knows that a new elephantine adventure is crystallizing.

"Babar's family is my family," says Laurent; "his friends are my friends." This does not quite mean that Babar is a self-portrait. Laurent, who is twice as trim and only half as bald as Babar, also has a wilder side to his nature—what he calls an anti-Babar side. Some-



In *Babar's Birthday Surprise*, millions of birds fly up on signal, revealing newly sculpted monument.

So as not to tip over the San Francisco cable car, ever-thoughtful Babar rides opposite the youngsters.

Laurent de Brunhoff got the idea for this story after visiting Mt. Rushmore on a sight-seeing trip.

With paddles adroitly grasped in their trunks, Célesteville residents explore a subterranean river.

times it bursts out in the books he writes about other animals, rather weird animals like the One Pig with Horns, an aggressive little creature who goes around trumpeting "I AM THE STRONGEST OF ALL, I AM THE HANDSOMEST OF ALL." Gentlemanly Babar would be acutely uncomfortable to find himself shut up in a room with this pig. Readers have shown mixed feelings about him. Some find him a scream, while others frankly hate him.

An elephant with bourgeois tastes

There is unanimity about Babar. Everybody loves him in all his books, of which there are 34 so far. The worst that liverish commentators have found to say about him is that with his close family life, his devotion to old-fashioned standards of conduct, his tastes for an old pipe and a jug of mineral water, his visits to the Célesteville Theater where elephants in perukes perform in 17th-century plays, and his trips to the seashore in summer and the ski slopes in winter, he is nothing but a French bourgeois in king's clothing.

It is true that the de Brunhoffs are French to the core, though they derive their name from a distant Baltic ancestor. And so Babar's outlook, like his clothes and the statues of elephants in antique costumes on his palace grounds, is unmistakably French. But his values are universal. Children around the world have no trouble accepting him as one of their own. In this country alone, more than five million copies have been sold. You will find Babar books in more than 17 languages, including Hebrew, Hungarian and Japanese.

The explanation of his appeal in all these lands is locked in the mystery that surrounds all successful works of art. There is no doubt, however, about what makes Babar unique. It is simply that he is so ordinary.

Officially approved lists of children's books are apt to include numbers of anodyne, insipid, right-thinking heroes and heroines. Children are usually bored by them. Like their elders, they prefer more striking, not to say bizarre, personalities. The animal figures that have achieved renown over the ages are nearly always stamped with something excessive, exaggerated. Reynard the Fox and Brer Rabbit are terribly clever. The wolf who drops in on Red Riding Hood's grandmother is terribly wicked, and has a terrible appetite to boot. Winnie-the-Pooh is terribly cute. Learned divines and psychiatrists have often warned of the danger such irrational creations can represent for immature minds. But children, with their defiantly catholic tastes, have shown an equal enthusiasm for all of them, just as they respond even-handedly today to the homicidal manias of Wile E. Coyote (Road Runner's nemesis) and the inoffensive sighs of Snoopy the

beagle as he tiptoes through the garden of his neuroses.

In this company of eccentrics, Babar—equally loved, equally admired—plods along like the plain gray elephant he is. Unlike them, he spends most of his time living quietly at home with his family or taking them on scenic tours. Unlike them, too, he holds down a steady job—he has been King of the Elephants for half a century—and though the demands of the office do not appear to be excessive, he is always present when duty calls, whether it is to build a city where all his subjects will have a room with a view, or to devise psychological-warfare stratagems against aggressors from Rhinocerosland. He takes these responsibilities, as he takes everything else, with aplomb.

It is not that Babar's life has been without incident. It has, on the contrary, known its share of tragedy and turmoil. When he was still a child, he saw his mother killed in front of his eyes by a wicked hunter (p. 93). He has been kidnapped, forced to sleep on straw, compelled to put on a degrading performance as trumpeter in a circus (pp. 92-93). He has been stranded on a desert island. His kingdom has been ravaged by flood and fire, and overrun by savage, snorting rhinoceroses. His piano and his car have been stolen by hoodlum crocodiles. He has been haunted by a ghost, Baron Bardula, who once disrupted a royal chamber-music recital by blowing with fleshless lips into a nearby saxophone.

All these incidents have only confirmed Babar in his fundamental nature—imperturbable, gregarious, sweet-tempered. He and his queen, Céleste, and their children and their cousin Arthur and their monkey Zephir and the nice Old Lady who gave Babar his first suit of clothes, all go on, bound together by mutual trust and affection.

This is a world where misfortune can arrive at any time, but—as Babar found out when he had a bad dream—you can always count on a flight of winged elephants labeled Joy, Perseverance, Learning, Courage, and so on, to arrive in a blaze of light and rout the dark imps of Ignorance and Laziness and Anger and Fear. When Babar awoke from this dream, he felt "ever so much better." And so do millions of us when we enter this orderly, old-fashioned world.

Life is full of surprises, accidents, deaths, snakebites, rhinoceroses. But life goes on; with a little effort on everybody's part it goes on fairly steadily. "If there is a moral in the Babar books," says Laurent de Brunhoff, "it is *Pas de panique*. Don't panic."

Virtuous elephants stampede misfortune in Babar's dream from *Babar the King*, 1933. He had fallen into restless sleep after a bad day filled with snakebites and house fires, but felt much better when he awoke.

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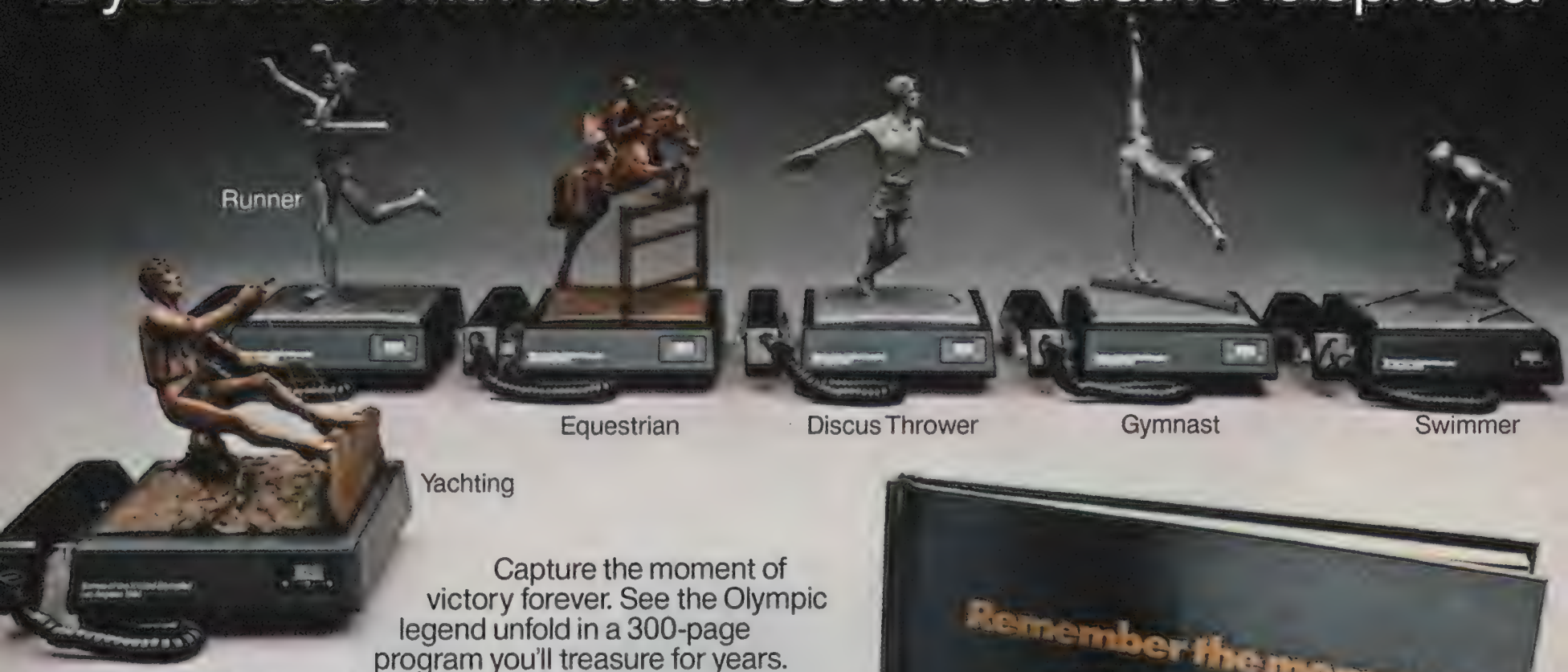

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A harvester ant carries jawbone of a marsupial that lived in Nebraska about 32 million years ago.

Article and photographs by Daniel B. Adams

A fossil hunter's best friend is an ant called 'Pogo'

When paleontologists hunt for the ancient remains of small mammals, vital to evolution studies, an enterprising insect lends a hand

Paleontological work in the Wyoming badlands was hotter than the fires of Hades that summer in 1889. The heat only made things worse for John Bell Hatcher: no matter how many spectacular fossils he managed to pry out of the rocks, he simply could not please his boss.

When he hunted gigantic rhinolike titanotheres in Nebraska and the Dakotas, Hatcher sent back nearly 200 of the 400-pound skulls. Just *one* of his summer shipments to Eastern museums included more than 24,000 pounds of titanothere bones. When he went after horned dinosaurs he got 33 skulls; a skull of *Triceratops* could measure more than seven feet in length and weigh more than 800 pounds. Most of the skulls Hatcher collected were from deep ravines as far as 40 miles from the railroad; bringing them out was quite a feat for a man often so crippled by rheumatism that he needed assistance to mount his horse.

But still his employer, Professor O. C. Marsh of Yale University, was not satisfied. Marsh hounded Hatcher relentlessly, demanding that he quickly find the rarest, most elusive fossils of all: the teeth and

Illustrations by Dawn Adams

Pogo ants shine as fossil finders

After anthill material is washed through screen, fossil fragments—here, another marsupial—remain.

Human finger at right gives scale to jaw fragment of *Alphadon*, an ancient relative of the opossum.

bones of the diminutive mammals that had lived alongside the dinosaurs during the Age of Reptiles. "The cost of getting these tiny mammals," complained Marsh, "makes their value greater than their weight in gold." Each microscopic mammal tooth that Hatcher shipped East represented hours of backbreaking labor, crawling over the sweltering badlands on hands and knees. "You seem to think that . . . mammals are everywhere abundant out here," Hatcher angrily telegraphed Marsh, "and all that is necessary is to go out and scoop them. . . . They are very rare and about two teeth represents an average patient day's work." The trickle of teeth that Hatcher sent back only seemed to aggravate Marsh, and Hatcher was in constant despair.

Suddenly, almost overnight, the trickle turned into a torrent. "I broke the record yesterday by finding 87," wrote a happy Hatcher in August 1889. Soon hundreds, then thousands, of the valuable fossils poured out of Wyoming. Marsh was jubilant! Other paleontologists and fossil collectors were stunned. How had Hatcher done it? How could one man have done the work of a virtual army of collectors? There was a simple—if bizarre—explanation: big red ants were crawling around and collecting the fossils, while Hatcher merely raided the anthills. In 1896 he published the details of his anthill secret in only six sentences, barely more than an afterthought in a paper on horned dinosaurs and Cretaceous mammals.

Ants harvest seeds and fossil riches

Today paleontologists still pick fossils off anthills in the field just as Hatcher did; more often, we use ants to show us where the best fossils are. Not just any ants collect fossils, of course. In North America only the large, red Western harvester ants, *Pogonomyrmex occidentalis* and related species—affectionately known as "Pogos" to the scientists who study or use them—routinely carry fossils to their mounds. Pogos are found almost everywhere west of the Mississippi, but they do their best fossil collecting in the Great Plains and Mountain states of North and South Dakota, Wyoming, Idaho, Montana, Colorado and western Nebraska. Pogos earned the name "harvester ant" because they eke out a living by gathering small seeds that they store in underground granaries. When not hunting seeds, they actively seek out small, hard objects to drag back to their mounds—little rocks, garnets, miniature quartz crystals and fossilized teeth and bones are all suitable, and they turn up in quantities that depend on their local abundance.

The fossils that ants collect are almost always from small animals, few larger than rats. Big animals that do end up on a mound are only represented by tooth fragments or chips of bone. Although a healthy Pogo

This anthill in the badlands of western Nebraska is the kind eagerly sought out today by paleontologists. Hills are often rich sources of mammalian fossils scattered in the sediments millions of years ago.

can drag up to 30 times its own weight, the largest anthill fossils rarely exceed the size of the ants themselves, about three-eighths of an inch. Fossils of rodents, bats, tiny marsupials, primates, lizards, snakes, amphibians and fish are all likely candidates for being carried home by Pogos, but none ever arrives as a complete skeleton. Teeth, foot bones, jaw parts and other ant-size fragments that have eroded from the local terrain are carried back to form a virtual hash of skeletal parts on the anthills.

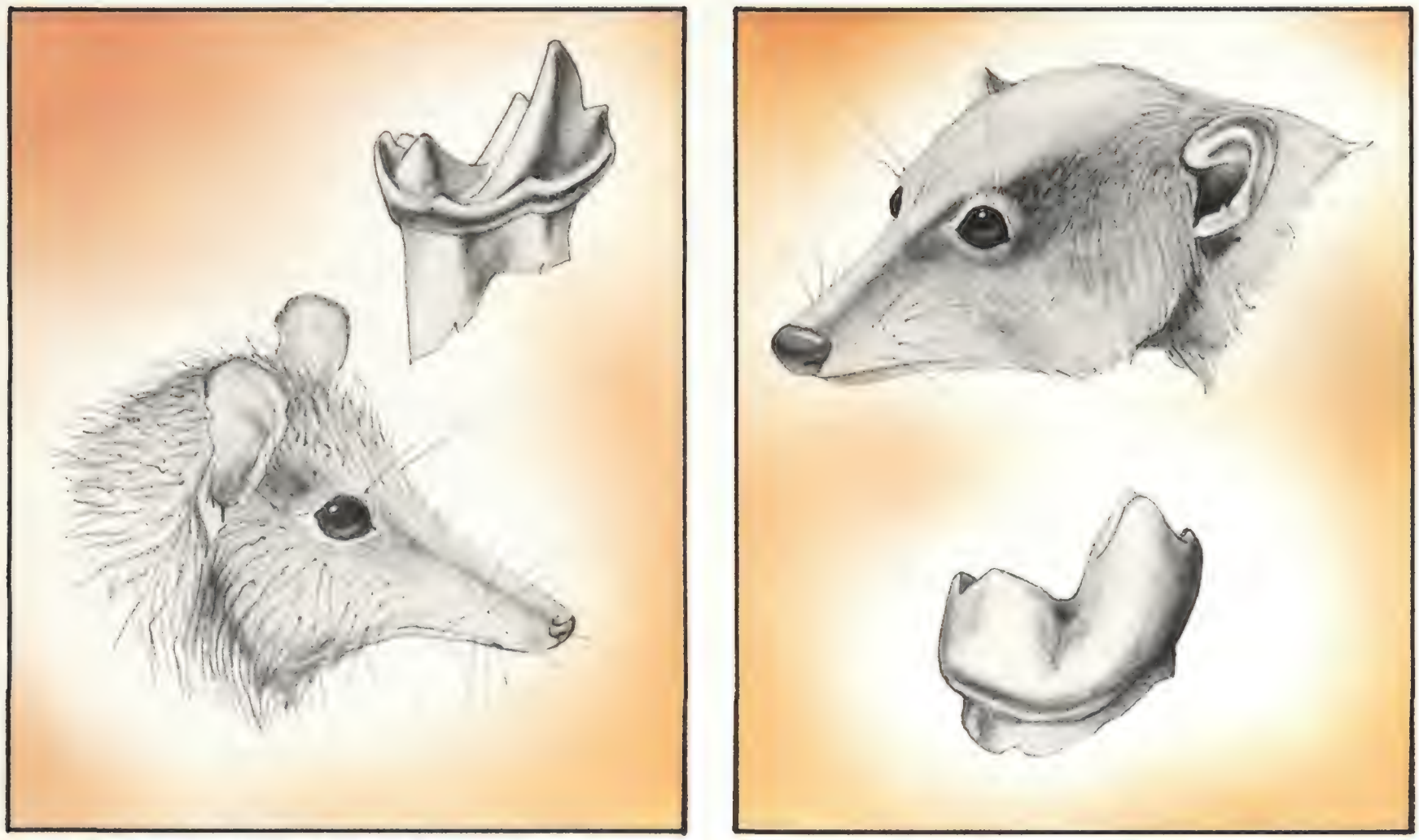
Despite years of investigation, no paleontologist or entomologist has offered a convincing explanation of why Pogos collect the things they do. Most paleontologists seem to think that coarse surface materials protect the mound from rain and wind erosion. Another theory, favored by some entomologists, is that the hard, dense objects act as a solar-heat storage layer to help incubate the Pogo eggs and larvae that are inside the mound.

Pogo anthills are easy enough to spot. The hill itself can be up to two feet high and three feet across, and the ants often strip away all vegetation around the hill to a radius of five feet or more. The result is a conspicuous brown circle that can be spotted from a half-mile away on the ground and from still farther away from the air. Although richly fossiliferous anthills are rare, they can be depended upon to produce a new crop of fossils year after year, provided, of course, that no one gets greedy and digs up the whole colony, killing off the Pogos.

Of course not every hill has fossils in it; it takes a trained eye to find those hills that are worth collecting, and experience to collect them well. Occasionally a rich hill will produce hundreds, even thousands, of fossils. One in western Nebraska that I helped collect and process was composed almost exclusively of fossils —hundreds of jaws and thousands of teeth and bones.

Robert E. Sloan of the University of Minnesota has perhaps more reason than most other paleontologists to appreciate the significance of harvester ants. On a June evening in 1962, accompanied by Leigh Van Valen of the American Museum of Natural History and William Nelson of the University of Tennessee, Sloan was driven to a desolate spot near Bug Creek, Montana. The scientists were anxious to check out a cow trail where several teeth of Cretaceous mammals had turned up. Thousands of these mammalian fossils had already been found by John Hatcher and others,

A graduate student in paleontology at Berkeley, Daniel B. Adams has harvested the fruits of Pogo anthills in Wyoming, Nebraska and Nevada.



Small mammals that lived 50 to 70 million years ago have been artistically reconstructed from teeth found in anthills. The primate at left somewhat resembled a tree shrew; a marsupial is at right.

but they were mainly marsupials or the strange, rodent-like multituberculates. The new cow-trail fossils were from true placental mammals, of which only about a half dozen or so like them had ever been found.

As Sloan tells it, their driver was pressed for time and gave the scientists only five minutes to check out the locality. They found the cow path where the original find had been made. "But then we saw some anthills off to the side," says Sloan. Each man dashed to a hill. By the end of the allotted five minutes they had gathered 33 teeth and jaws of Cretaceous placental mammals, more than doubling the known number of specimens like these in the world.

The discovery touched off a virtual stampede of paleontologists into the Bug Creek badlands. Sloan estimates that various museums and universities have collected more than 40 tons of Bug Creek anthills and fossil-bearing matrix over the years. No one knows how many fossils are involved, but the figure is almost certainly in the tens or even hundreds of thousands. One of the most important mammals to come from the Bug Creek anthills is tiny *Protungulatum*, a primitive animal believed to have given rise to all the later hoofed mammals and their relatives: horses, rhinos, antelope, camels, pigs, deer, and even elephants, sea cows and whales.

Another paleontologist who capitalizes on harvester ants is Larry Martin at the University of Kansas. "The beautiful thing about ants," says Martin, "is that it's like having literally thousands of little workers in your employ—and they're a lot more efficient than any humans you could find." In 1972 Martin set out to look for fossils in rocks of the Harrison formation along the Wyoming-Nebraska border. The Harrison badlands were world-famous for their prehistoric rhinos, camels, odd "giant pigs," and beavers that lived in peculiar corkscrew burrows (p. 104), but little was known about the small mammals that might have lived there 22 million years ago.

A few days and a dozen anthills later, Martin had amassed more than 7,000 teeth and jaws. Among the finds were peculiar types of mice, squirrels, hedgehogs, moles, gophers, legless "worm lizards," rabbits and primitive "mountain beavers."

It might seem a logical next step to encourage ants to collect at important sites where they do not naturally occur. Generations of paleontologists were fascinated by Hatcher's 1896 publication claiming success at actually planting Pogo colonies wherever he wanted them to harvest fossils. "In localities where these ants have not yet established themselves, but where [fossil] mammals are found to be fairly abundant it is well to

The multituberculate above, a rodentlike animal, has no close surviving relatives today. At one time, however, there were dozens of species throughout the world, and their fossils are abundant in anthills.

bring a few shovels full of sand with ants . . . and plant them on the locality. They will at once establish new colonies and," claimed Hatcher, "if visited in succeeding years, will be found to have done efficient service in collecting mammal teeth and other small fossils. . . ."

But today entomologists are dubious about the idea. "There's no way to transplant a colony in the field without taking the queen along," says Pogo expert Steven Rissing at Arizona State University. Even if a queen were located (no easy task in an eight-foot-deep nest), her chances of survival in a new locality would be slim, he maintains.

In the 19th century, John Hatcher had carried an old flour sifter with him to harvest each hill on the spot, but many modern paleontologists have improved upon this with "screen washing" techniques. Part of the hill and surrounding ground are excavated, carried to the nearest pond or stream and washed through screens under water. The clays and soft sand particles dissolve away and leave a residue of fossils (p. 100).

When Robert Sloan collects an anthill, on the other hand, he locates and plugs all the entrances to the hill to keep the Pogos locked up inside. Each ant has a potent stinger in addition to powerful jaws. "I've been hit so many times over the years that now I've got a serious allergic-reaction problem," he says. With a shovel he quickly transfers the outer layers of the hill to a sturdy burlap bag that is whisked away, not to a nearby stream but to a museum. There, the fossils are "concentrated" or separated from the other materials by processes not unlike panning for gold. Sometimes the matrix is dried in an oven and then soaked in kerosene, a technique that dissolves away the clay grains and leaves everything else intact. Because fossils are usually the densest matter in the mound, they can be concentrated even further by "heavy-liquid separation." The matrix is first poured into funnels filled with a thick, heavy liquid such as bromoform. The lighter gravels and rock debris float to the top and are discarded, while the heavier material, including fossils, gradually sinks to the bottom.

The final step of separating the fossils from their matrix is accomplished by the "pickers," trained technicians who examine small spoonfuls of concentrated matrix under a low-power microscope, pick the fossils out with tweezers and drop them into small sorting boxes. The actions of an experienced picker are like the recipe incantation for a witch's brew: "thumb bone of mole," *kerplunk*, "lizard jaw," *kerplunk*, "vertebra of toad," *kerplunk*.

Teeth and jaws are the most important. Many fossil animals, in fact, are known only from their teeth. Once these prizes are sorted out, each is carefully glued to the head of a straight pin (p. 100), assigned a number and stored in a corked glass vial. Later on, it's easy enough for a paleontologist to pop the cork out and manipulate the pin under a microscope for study. A single specimen case may contain thousands of such vials; even smaller museums find that they must computerize their collections just to keep track of the flood of anthill fossils.

To Sloan and other paleontologists, these millions of anthill fossils may hold the key to some of the most significant questions about evolution. Perhaps the most hotly debated paleontological issue today is the "punctuated equilibrium" controversy. Does evolution mainly proceed by a slow, gradual process of change or do new species arise suddenly and rapidly?

Before anyone can answer that question convincingly for the vertebrates, huge samples of extinct populations will have to be described and studied carefully—first, to learn how much variation was present; second, to learn about the rates of skeletal change through time. "You'll need a great many samples of huge populations for that," says Sloan, "and the only way we're ever going to get them is from the ants."

Larry Martin points out that tracing the evolutionary history of large mammals is frustrating because of the scarcity of intermediate species. "With these enormous samples of the smaller mammals, however, there are fewer gaps in the record. For example, I can collect and examine perhaps a thousand teeth from a single rodent species, all from a few closely associated anthills. I can then go collect at a different hill locality and expect to get a thousand more teeth from the same or a closely related species. There's no way I could do studies like that with big animals." Martin also feels that these little fossils hold clues to past climatic and environmental conditions.

It is possible that some of the largest and most important fossil collections of all time will have been made by ants. These unsung heroes have already revealed the previously hidden world of tiny prehistoric animals, and they hold the promise of answering some of paleontology's most intriguing questions. Was the climate changing at the end of the Age of Dinosaurs? Is the punctuated-equilibrium theory valid? What were Man's earliest primate ancestors like? The answers may lie somewhere in the badlands right now—on an anthill.

Ancient land-dwelling beavers dug corkscrew burrows. Extinct gopher is in separate burrow, upper right.

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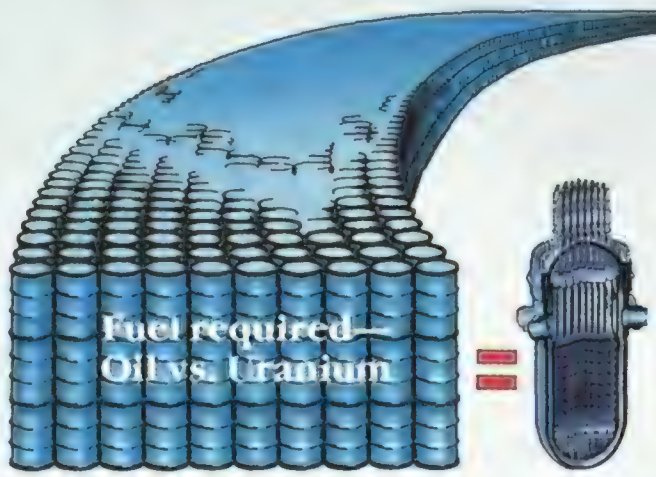

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By Donald Dale Jackson

If women needed a quick pick-me-up, Lydia provided one

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As the symbol of her family's company, Lydia Pinkham's maternal visage made her product a big seller, but it also inspired writers of mocking doggerel.

Her face was kindly and yet stern, sympathetic and self-contained, wise and perhaps a shade austere. There was no frivolity in those tranquil unblinking eyes, no hint of deception in that resolute mouth. A sensible comb held her gray hair in place at the back, while a fringe of white ruching climbed her neck. Lydia Pinkham's face belonged in an oval frame on everybody's parlor wall; it was the sort of visage that God had in mind when he created grandmothers. And it was probably seen by more Americans than any other female countenance in the late 19th and early 20th centuries.

When the resourceful Pinkham brothers of Lynn, Massachusetts, decided to use their mother's face to advertise the vegetable compound that she made, "a Positive Cure for all those Painful Complaints and Weaknesses so common to our best female population," they hit upon one of the most inspired notions in the annals of Yankee enterprise. The nostrum that Lydia had once brewed on her stove and given away to friends and neighbors became one of America's most popular and most heavily advertised patent medicines. Lydia's face, gazing out in everlasting serenity from labels and boxes, from newspaper and magazine ads, from barns and rural fences and even from plates, was her family's fortune.

If it also attracted undergraduate songwriters, well, that was all right too. It was free advertising, with verses such as: "Tell me, Lydia, of your secrets/ And the wonders you perform./ How you take the sick and ailing/ And restore them to the norm." The refrain went: "I will sing of Lydia Pinkham/ And her love for the human race;/ How she sells her vegetable compound,/ And the papers they publish her face."

The occasional sorehead offended by her ubiquity could be tolerated as well. "If it is necessary that you should parade your portrait in every county paper in the United States," a

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letter writer from Illinois grumped in 1880, "*can't* you in mercy to the nation have a new one taken once in a while? Do your hair a little differently say—have a different turn to your head and *look solemn*. Anything to get rid of that *cast-iron smile*! You ought to *feel* solemn anyway that your face pervades the mind of the nation like a nightmare. . . ."

The Pinkhams could afford to turn the other cheek to college sophomores and ill-tempered Midwesterners. Women everywhere—the compound was eventually sold in several foreign countries as well as the United States—swore by it as a cure for female maladies of all descriptions: menstrual pains, "flooding," backaches, irregularity, "bearing down pains," "falling of the womb," barrenness and much more. They poured out their gratitude and their problems in numerous letters to the matronly lady of Lynn who described herself, without false modesty, as the "Saviour of her Sex." And Lydia, as long as she was able, made it a point to answer them, dispensing sensible advice and miscellaneous remedies.

The woman behind the homespun advice had always thought for herself, a characteristic that in 19th-century New England qualified her as liberated. The daughter of a well-to-do Quaker who began as a shoemaker and later prospered in real estate, Lydia Estes had grown up in a family in which girls as well as boys were encouraged to form their own opinions and express themselves freely. She had been an early advocate of both women's rights and the abolition of slavery; some ads that were later composed for her compound owed part of their appeal to the strong dose of feminism they contained: male physicians, they claimed with considerable justification, were ill-prepared to treat the afflictions that beset women, and male employers were unsympathetic. "Woman Can Sympathize With Women," the ads proclaimed. The compound was "A medicine for woman. Invented by a woman. Prepared by a woman."

Lydia taught school in Lynn for several years before her marriage in 1843 to Isaac Pinkham, a restless entrepreneur who shifted from manufacturing to farming to building and real estate speculation without ever

Years before she became "Saviour of her Sex," Lydia posed with baby Charles.

Lydia's husband, Isaac, was a small-time entrepreneur who went broke in 1873.

I N T R O D U C I N G

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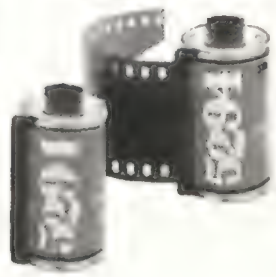

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Second son, Dan, an energetic hustler, promoted compound in Brooklyn.

Charles Pinkham, the oldest son, ran family's business after his brothers died.

It was youngest son, Will, who came up with idea of advertising elixir in papers.

achieving much success. Charles, their first child, was born in 1844. Dan was born in 1849, Will in 1852 and Aroline in 1857. Lydia kept house and raised the children in a succession of houses that Isaac bought and sold.

According to legend, the formula for the elixir that made the Pinkhams famous originally came into their hands as a result of a defaulted debt. Isaac had endorsed a note, the story goes, for a machinist named Todd. When Todd could not repay the loan, Isaac advanced him $25 and Todd gave him the formula in exchange. It is equally likely that Lydia, who like many housewives concocted her own medicines from herbs and other plants, had found the secret of the vegetable compound in a medical handbook of pharmaceutical botanicals. In any case, she cooked up an experimental batch and tried it, found it beneficial and soon began sharing it with her neighbors. The ingredients, which she carefully listed in a notebook, were unicorn root, life root, black cohosh, pleurisy root and fenugreek seed. The herbs were steeped and macerated, percolated through cloth, mixed in a solution—about 18 percent alcohol, as a necessary preservative—and then bottled.

The financial panic of 1873 and the depression that followed were indirectly responsible for transforming Lydia's neighborhood nostrum into the potion soon to be trumpeted as "the greatest medical discovery since the dawn of history." The crash caught poor Isaac with his credit overextended and ruined him, shattering his health along with his dreams, though he lived on until 1889. The boys, then in their 20s, and Aroline, still in her teens, took what work they could find to help with the bills—Charles was a horse-car conductor, Dan a mail carrier, Will a wool-puller and Aroline a teacher.

One day in 1875 the family was gathered in the kitchen when several women from nearby Salem appeared at the door. They had heard about Mrs. Pinkham's medicine, they said, and they wished to buy some. Lydia sold them six bottles for $5. Dan, the most imaginative and aggressive of the brothers, was the one who made the suggestion: Why not go into the *business* of selling the brew?

The manufacture and marketing of the product they called "Lydia E. Pinkham's Vegetable Compound" was a family operation from the beginning. The young Pinkhams kept their outside jobs at first, spending their wages on herbs and alcohol and a four-page printed pamphlet which they distributed in Lynn, Boston and the neighboring towns in their off-duty hours. Lydia, with Will's help, mixed and cooked the compound in the cellar and wrote copy for the pamphlet. The first of many such booklets the company would produce, it was called "Guide for Women."

Bursting with Yankee energy and ambition, open to any promising new idea and doggedly persistent, the Pinkham family personified the 19th-century ideal of American enterprise and ingenuity. "There is no use in doing business," Dan once declared with typical expansiveness, "unless we do a devil of a business."

But their greatest asset, the most potent weapon in their arsenal, was mother. Lydia was the genuine article, a true believer who never doubted and never wavered: she knew that her medicine was good, that it made women feel better, that it was, in fact,

Donald Dale Jackson's gypsy moth article appeared in the May issue.

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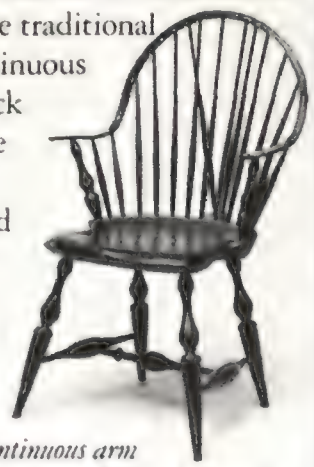

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a better remedy than anything that formal medical science could offer. And beyond that she seemed to know that women needed someone who would listen sympathetically to their anxious complaints about their bodies, someone who could explain the things that puzzled them, someone they could turn to who would *understand*. With all that going for them, the Pinkhams could hardly miss.

First, however, they had to spread the word. The circulars they distributed close to home yielded barely enough sales to keep them going, sometimes only a single one-dollar bottle a day. In the spring of 1876 Dan took a bold step. Quitting his job, he packed a bundle of pamphlets and moved to Brooklyn to try to expand their market. He spent his days circulating the advertisements and cultivating druggists. Evenings he wrote high-spirited letters home—"Fellow Doctors," they sometimes began—detailing his progress and discussing schemes to increase it. In one letter he suggested that they drop company calling cards in cemeteries before Decoration Day containing what looked like a personal note: "Try Lydia E. Pinkham's Vegetable Compound and I know it will cure you, it's the best thing for Uterine Complaints there is. From your cousin, Mary—P.S. You can get it at . . . ." He dismissed any ethical doubts this tactic might trigger: "They're all such darned frauds as that."

Dan's biggest problem was prying operating funds out of the skimpy family treasury. He was willing to wear the same shirt for two or three weeks, he wrote, but if business "isn't good enough to supply me with food then I want to get out of it." At times he veered close to despair—"I sometimes feel as if I didn't know whether this was going to pay or not"—but he invariably rebounded with another brainstorm. In one letter he proposed that their pamphlets should promise relief to sufferers of kidney maladies, too, "as about half of the people out here are either troubled with Kidney complaints or else think they are." Their Guide soon included the claim that "for the cure of kidney complaints of either sex, this compound is unsurpassed." In another letter he was obliged to report a setback—one woman was "a great deal

The Pinkhams' first factory (left) was next door to the family home in Lynn, Massachusetts. This 1879 view was used on advertising cards.

After business started booming, Pinkham operation moved into a "laboratory" built in 1886. Charles is beside wagon with his daughters and their friend.

sicker" after quaffing a trial bottle. Complaints,/Would Have Prevented the Direful Deed."

Though Dan was the catalyst and the chief hustler in the family, it was an inspiration of younger brother Will's that produced the first major breakthrough. On an impulse, he called at the *Boston Herald* one day and asked the cost of printing the four-page Pinkham pamphlet on the front page. Sixty dollars, he was told. Having just collected $84 from a drug wholesaler, he bought the space. Within two days new orders came in from three other wholesalers, and the Pinkhams had the first glimpse of their eventual boulevard to fame and prosperity.

The newspaper ads, written by an agent the Pinkhams hired, were initially blocks of print topped by layers of headlines, and could thus easily be mistaken for news stories. "A FEARFUL TRAGEDY," one began. "A Clergyman of Stratford, Conn.,/ Killed by His Own Wife./ Insanity Brought on by 16 Years of Suffering With/ Female Complaints the Cause./ Lydia E. Pinkham's Vegetable Compound,/ The Sure Cure for These

Some later ads were less sensational. One pledged that the compound "gives elasticity and firmness to the step, restores the natural luster to the eye, and plants on the pale cheek of woman the fresh roses of life's spring and early summer time."

Lydia, calmly overseeing matters in Lynn, had to increase production to meet the demand created by the ads. By 1878 the operation had outgrown her cellar and expanded to a building next door, which soon had to be enlarged. But somehow Lydia still found time to read and answer the pleas for advice that poured in, together with unsolicited testimonials. "For the last seven years I have suffered with falling of the womb," a Philadelphian wrote in 1877. "I was unable to walk about the house without suffering intense pain. I had tried different kinds and had almost given up in despair when I commenced taking your vegetable compound. I have taken two bottles and I *can already walk three miles without difficulty.*"

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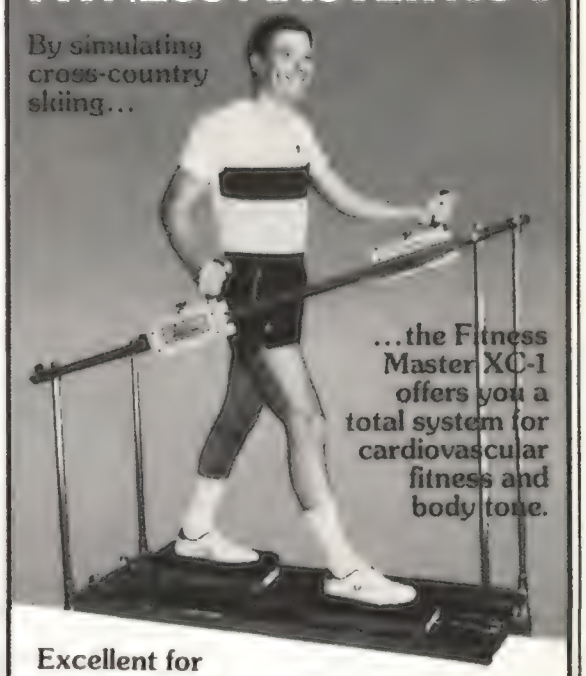
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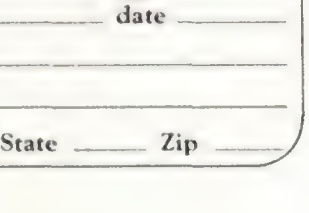

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Dan, shuttling between Lynn and New York, scored a coup when he persuaded Charles Crittenton, a leading patent medicine dealer in Manhattan, to stock the compound. When the product "does become general in New York," he wrote home, "our fortune is made."

But it was another idea that Dan had been mulling over awhile that finally launched the business into orbit. Dan had noticed that homemade goods, especially those identified with New England, were particularly popular. He thought about billing the compound as "The Great New England Remedy," then envisioned a "pretty little picture of a healthy woman" in their ads. No product had a better claim to a downhome, New England identity than the compound—the business would continue to operate next to the family home, in fact, for nearly a century. In 1879 the dim notion in Dan's mind snapped into focus: he suggested that Lydia pose for the portrait they would henceforth use as the company symbol. Lydia, at 60, was about to become a cultural icon.

The effect on business, reported one newspaper, was immediate: it doubled. Lydia's "cast-iron smile" began appearing in the press at a time when female faces were still rare enough in American dailies to seize a reader's attention. For years hers was one of the few on display; editors lacking a picture of Queen Victoria or other noted women would sometimes use Lydia's portrait as a substitute. A Massachusetts paper calculated the picture's impact on the Pinkham ledger books in 1881: $250,000 in annual sales, with approximately $150,000 plowed back into advertisements—a ratio that would persist for decades. The compound was now available not only in liquid form but in pills and lozenges, and the company made "liver pills" and a "blood purifier" as well.

By this time Lydia was receiving about 150 letters a day and she faithfully endeavored to answer them. Much was made of the fact that her advice to correspondents was strictly confidential, which, in fact, it was—so much so that few snippets remain today. But Lydia's entries in her own

Remedy ads encouraged women to write Lydia for advice and they did. Their letters were answered in this room by "women only," then stored in files at rear.

notebooks detail what she prescribed for some maladies. To a husband who wrote on his wife's behalf she responded: "Keep upon her bowels a cloth saturated with Comp." For sterility: "In some women nothing is the cause but too intense passion and excessive intercourse"—however, she added meaningfully, "It is not always the fault of the wife—many husbands are sterile." For gas and belching, Lydia recommended trying spearmint steeped in water with sugar, rhubarb and baking soda.

While much of Lydia's advice to letter writers seemed to come straight out of an almanac, a lot of it was just plain common sense. Cleanliness, diet, exercise and fresh air were her first principles. Thus, a typical Pinkham letter urged: "Eat no pastry nor fine flour, but instead graham bread, the various mushes and fruit. Ride out, walk out, dig, use the trowel. Study the hygienic laws that your nature requires."

With their ads papering the nation, with the straight-talking pamphlets still bearing Lydia's customary signature line of "Yours for Health," and with newly satisfied customers checking in daily, the Pinkhams could see nothing but good times ahead—and then calamity struck. Dan developed a persistent cough and chill that he couldn't seem to shake. His mother, ever faithful to her homemade cures, prescribed Pinkham's liver pills coupled with a mixture of "Pleurisy root and Bugle weed and one-half ounce of Marsh-mallows."

Dan had tuberculosis. When he failed to improve the following year, he went to Georgia for the winter, returning in the spring of 1881 weaker than ever. He died in October, a month before his 33rd birthday. The Lynn paper called him a martyr to the business he had done so much to build. Before the family could recover from that shock, another blow descended: Will, too, had contracted TB (then called "consumption"). Only 28, he succumbed

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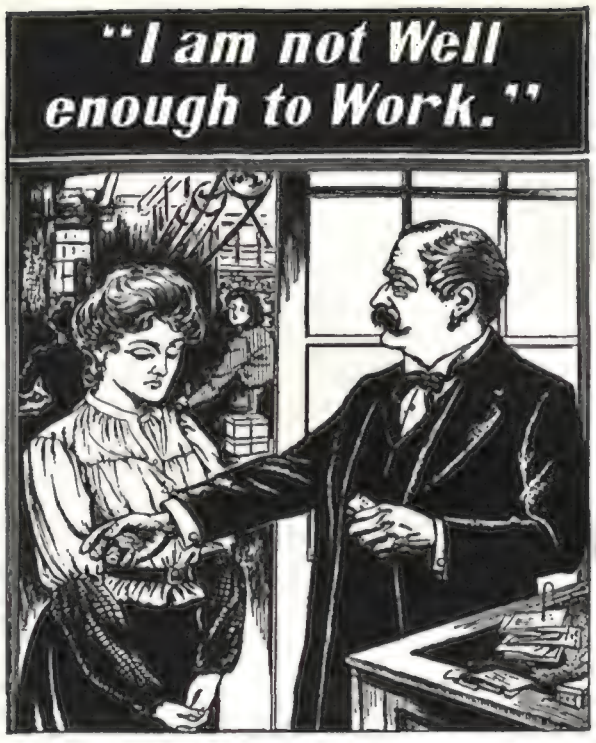
Nervous Breakdown

Pinkham ads varied in tone and approach but they consistently dealt with real problems. Two turn-of-century pitches headlined housewife fatigue (left) and working-girl "derangements" (right). A 1920s ad (above) went further, hinting that Lydia's "old-fashioned" remedy could even prevent nervous breakdowns.



in California—where he had gone to seek a cure—less than two months after Dan's death.

With the surviving brother, Charles, now in command, the company continued to spend a heavy share of its annual revenues—as much as 78 percent, in 1882—on advertising, and it continued to pay off. But Lydia, shaken by the double tragedy, seemed to lose heart. A longtime believer in spiritualism, she arranged frequent séances in hopes of communicating with her dead sons. Just before Christmas 1882 she suffered a stroke that left her paralyzed. She died in May 1883 at the age of 64 and was buried beside her boys in Pine Grove cemetery, just a short distance from the bustling plant where a machine was stamping her portrait on the unending rows of boxes bearing the family's bottled magic.

Lydia and her compound attained even greater fame after her death. Women seeking advice and solace were still encouraged to "write Mrs. Pinkham, Lynn, Mass.," a gentle deception the company's advertising agent somewhat sheepishly tried to explain by pointing out that Charles' wife was also named Mrs. Pinkham. The volume of mail was so great that a roomful of women—"Men Never See Your Letters," the ads promised—worked full-time writing replies. The reassurances about respect for female modesty at the Pinkham plant provoked one anonymous correspondent, almost certainly a male, to protest that "the very office boy is a girl. The bird in the weathervane is unmistakably a hen." The male workers in the bottling room, the writer continued, "are forbidden, on pain of death, to read the labels."

Humorists, forever probing the frontiers of taste, were irresistibly drawn to Lydia and her conversationally taboo area of expertise. While she was still alive, a newspaper printed a hoax announcing that Lydia was engaged to a humor writer named Bill Nye—who hastened to reply that the engagement was off, but that he was accepting presents. He remained an admirer of Mrs. Pinkham, he said, a claim he later proved by nominating her for President. A new generation of college boys, meanwhile, grafted ever more daring verses onto the Pinkham songs: "'There's a baby in each bottle.' / Thus the old quotation ran./ But you read in every textbook/ That you still will need a man." And more: "Buy a bottle of your Compound?/ Not for me. A friend once, Lyd,/ Took a spoonful and I'd hate to/ Tell you what the damned stuff did."

The tone of the Pinkham ads began to change about 1890 when yet another advertising agent was hired. In place of Lydia's straightforward, call-things-by-their-names approach, there was a note of prudery now, and the early feminist overtones of her "Guide to Women" gave way to a more traditional view of woman's role: "A Healthy Wife Is a Husband's Inspiration," an 1897 ad declared. But the company's faith in advertising as the key to success remained steadfast. In 1898 the compound was the most heavily advertised product in the United States, its name as familiar as Coca-Cola and McDonald's are today. Sales climbed to a new peak of $1.3 million the following year, and before long the Pinkham message was being translated into Spanish, French, Dutch and even Chinese for foreign consumers. In China the name of the product was felicitously converted into "Smooth Sea's Women's Disease Medical Water."

In the early years of this century, muckraking journalists and the American Medical Association assailed the Pinkhams along with other patent medicine manufacturers for excessive and misleading advertising claims. The regulations that eventually resulted reduced the "Greatest Remedy in the World" boast on the label to a

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317081. Bach: Goldberg Variations—Glenn Gould *(Digital*—CBS Masterworks)

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321299. Beethoven: Piano Sonatas No. 12 & 13—Glenn Gould, pianist (CBS Masterworks)

232496. Beethoven: Symphony No. 3 (Eroica)—Bernstein and New York Philharmonic (Columbia)

321570. Beethoven: Symphony No. 5; Schubert: Symphony 8 (Unfinished)—Maazel, Vienna Philharm. (*Digital*—CBS Masterworks)

299883. Beethoven: Symphony No. 6 (Pastoral)—Tilson Thomas, English Chamber Or. (Columbia)

252874. Beethoven: Symphony No. 9 (Chorale)—Ormandy and the Philadelphia Orch. (Columbia)

325654-395657. Beethoven Piano Concertos No. 1 & 5 (Emperor)—Brendel, piano; Mehta and Boettcher, cond. (Counts as 2—Vox)

263293. Bolling: Suite For Flute and Jazz Piano—Rampal, Bolling (Columbia)

310201. Brahms: Piano Concerto No. 2—Daniel Barenboim; Zubin Mehta, New York Phil. (Columbia)

233130. Brahms: Symphony No. 1—Ormandy, Phila. Orch. (Columbia)

312439. Brahms: Liebeslieder Walzer; Neue Liebeslieder Walzer (complete) L.A. Vocal Arts Ensemble (*Digital*—Nonesuch)

246843. Chopin: Mazurkas, Etudes, etc.—Vladimir Horowitz, piano (Columbia)

309500. Copland: Rodeo; Billy The Kid—popular ballet scores played by Bernstein, New York Phil. (CBS Great Performances)

191874. Debussy's Greatest Hits—*Clair de lune, Afternoon of a Faun, Reverie,* etc. Bernstein, Ormandy, etc. (Columbia)

230433. Dvorak: Symphony No. 9 (New World)—Bernstein and New York Phil. (Columbia)

187112. Gershwin's Greatest Hits—*Rhapsody in Blue* (Bernstein, piano); *An American in Paris* (Ormandy, Phila. Orch.); *3 Preludes* (Levant, piano); many more (Columbia)

318295. Gershwin Live!—Sarah Vaughan sings *The Man I Love,* etc. Thomas, Los Angeles Phil. (CBS)

319004. Glass, Philip: The Photographer—"Some of his best music to date" —*Time* (CBS)

316018. Glass, Philip: Glassworks—"moving, exciting and profound!"—*The N.Y. Times* (CBS)

201665. Grofe: Grand Canyon Suite—Ormandy, Phila. Orch. (Columbia)

323543. Handel: Royal Fireworks Music; Oboe Concertos 1-3—Karl Munchinger, Stuttgart Chamber Orch. (*Digital*—London)

257956. Haydn: Symphonies No. 101 (Clock) **and No. 103** (Drum Roll) —Bernstein, New York Phil. (Columbia)

321190. Liszt: Hungarian Rhapsodies 1, 4, 6; Rakoczy March; etc.—Boskovsky, Phil. Hungarica (Angel)

321208. Liszt: Hungarian Rhapsodies 2,3,5; Mephisto Waltz—Willi Boskovksy, London Phil. (Angel)

314369. Mahler: Symphony No. 1 (Titan)—Maazel, Orch. Nat'l de France (CBS Masterworks)

305730. Mendelssohn: Symphony No. 4 (Italian); **Overtures**—Andre Previn, London Symphony (Angel)

294264. Mozart: Piano Concerto No. 21 (Elvira Madigan) and **No. 17**—Ashkenazy plays, conducts Philharmonia Orch. (London)

325365. Mozart: Eine Kleine Nachtmusik; Symph. No. 40—Casals, Marlboro Festival Orch. (CBS Portrait)

314955. Mozart: Symphonies No. 40, 41 (Jupiter) —Szell, Cleveland Orch. (CBS Great Performances)

302570. Mussorgsky: Pictures At An Exhibition; Ravel: La Valse—Mehta, New York Phil. (Columbia)

310698. Offenbach: Gaite Parisienne; Saint-Saens: Danse Macabre; Dukas: Sorcerer's Apprentice—Maazel, Orch. National de France (Columbia)

318246. Orff: Carmina Burana—Muti, Philharmonia Orch. & Chorus (Angel)

300509. Prokofiev: Peter And The Wolf; Britten: Young Person's Guide To The Orchestra—Will Geer narrates; Somary conducts (Vanguard)

318691. Prokofiev: Love For Three Oranges Suite; Lt. Kije Suite—Thomas, L.A. Phil. (CBS Masterworks)

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318451. Ravel: Bolero; Pavane; Daphnis Et Chloe—Suite No. 2—Andre Previn, London Symphony (Angel)

324533. Respighi: Feste Romane; Pines & Fountains Of Rome—Dutoit, Orch. de Montreal (*Digital*—London)

318436. Rimsky-Korsakov: Scheherazade—Svetlanov, London Symphony (Angel)

232116. Rossini: William Tell Overture—works by Herold, Suppe, Thomas —Bernstein and the New York Phil. (Columbia)

304667. Saint-Saens: Carnival of the Animals; Variations on a Theme of Beethoven—Philippe Entremont, Gaby Casadesus, pianists (Columbia)

317677. Schubert: Symphony No. 8 (Unfinished); **Rosamunder Overture and Ballet Music**—von Karajan, Berlin Philharmonic (Angel)

225888. Smetana: Moldau, Bartered Bride Overture, Dances; Dvorak: Carnival Overture—Bernstein, NY. Phil. (Columbia)

310870-390872. Johann Strauss' Greatest Waltzes Ormandy, Szell, Bernstein (Count as 2—Columbia)

320424. Richard Strauss: Ein Heldenleben—Dicterow, violin; Mehta, N.Y. Phil. (*Digital*—CBS Masterworks)

281493. Stravinsky: Rite Of Spring. Zubin Mehta, N.Y. Phil. (Columbia)

308874. Tchaikovsky: Piano Concerto No. 1—Gavrilov; Kitaenko cond. Moscow Radio/TV Sym. Orch. (Col./Melodiya)

201129. Tchaikovsky: 1812 Overture; Serenade for Strings—Ormandy, Phila. Orch. (Columbia)

231563. Tchaikovsky: Swan Lake and **Sleeping Beauty Ballet Suites** —Ormandy, Philadelphia Orchestra (Columbia)

289207-399204. Tchaikovsky: The Nutcracker (complete)—American Ballet Theatre Production directed by Baryshnikov (Counts as 2—Columbia)

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321844-391847. Verdi: La Traviata—Original Motion Picture Soundtrack. Stars Domingo, Stratas (Counts as 2—Elektra)

321216. Verdi: Overtures —*La Battaglia Di Legnano, Nabucco,* etc. Muti, New Philharmonia Orch. (Angel)

324897. Vivaldi: The Four Seasons—Lorin Maazel and Orch. National de France (*Digital*—CBS Masterworks)

323733. Wagner: Orchestral Music from "The Ring"—*Ride of the Valkyries,* etc. Mehta and New York Phil. (*Digital*—CBS Masterworks)

MISCELLANEOUS COLLECTIONS

308890-398891. Bernstein Conducts World's Greatest Marches—Pomp and Circumstance; Washington Post; more (Counts as 2—Columbia)

317982. The Best of Liona Boyd—her own guitar arrangements of *Malaguena; Gymnopedie,* etc. (CBS)

311472. Placido Domingo With John Denver—Perhaps Love. Also: *Annie's Song; Yesterday;* etc. (CBS)

318675. Placido Domingo —My Life For A Song. *Besame Mucho;* etc. (CBS)

317651. Placido Domingo —arias from *Aida; Faust; Don Carlo;* etc. (Angel)

282582. Greatest Hits Of 1720. Includes **Pachelbel: *Kanon;*** Mouret: *Rondo (Theme "Masterpiece Theater");* etc. Richard Kapp, Philharmonia Virtuosi of N.Y. (Columbia)

322347. Marilyn Horne—Live At La Scala. Music by Granados, Handel, Copland, etc. (CBS Masterworks)

289520. Vladimir Horowitz Encores—virtuoso fireworks! Rachmaninoff, Chopin, more (Columbia)

320887. Kiri Te Kanawa—Verdi and Puccini Arias. Pritchard, London Phil. (CBS Masterworks)

321851. Wynton Marsalis. In his classical debut, he plays trumpet concertos by Haydn, Hummel, L. Mozart (*Digital*—CBS Masterworks)

323493. Mormon Tabernacle Choir—Gloria! Vivaldi: *Gloria;* Faure: *Sanctus;* etc. (*Digital*—CBS Masterworks)

311720. Luciano Pavarotti Premieres Verdi Arias—"Lost" gems from *I Vespri Siciliani,* etc. (Columbia)

300038. Luciano Pavarotti —O Sole Mio/Favorite Neapolitan Songs (London)

280610. Jean-Pierre Rampal Greatest Hits—Debussy's *Girl With The Flaxen Hair;* Handel's *Largo;* etc. (Columbia)

319582. Jean-Pierre Rampal Plays Scott Joplin. *The Entertainer,* etc. (CBS)

311647. Isaac Stern 60th Anniversary Celebration—master violinist is joined by Zukerman, Perlman, Mehta, etc. (Columbia)

259564. Joan Sutherland and Luciano Pavarotti—Duets. From *Rigoletto, I Puritani,* etc. (London)

316570. The Tango Project —*La Cumparsita; Adios Muchachos,* etc. William Schimmel, accordion; etc. (*Digital*—Nonesuch)

319848. Andre Watts—Live in Tokyo. Works by Ravel, Brahms, Debussy, Haydn, etc. (*Digital*—CBS Masterworks)

320895. Portrait of John Williams—*Theme from "The Deerhunter;" Fool On The Hill,* etc. (CBS Masterworks)

284612. John Williams & Friends—Bach, Mozart, Telemann, etc. (Columbia)

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Social Tragedy
Women Who Brave Death for Social Honors.
In the midst of one of the most brilliant social functions of the season, a noted society woman started suddenly from her chair with a scream of agony and fell insensible to the floor.
A few hours later the distinguished physician told her anxious husband that she was suffering from an acute case of nervous prostration brought on by female trouble, and hinted at an operation. Fortunately a friend advised her to try
Lydia E. Pinkham's Vegetable Compound
The result was that she escaped the surgeon's knife and to-day is a well woman.
The derangement of the delicate female organism sets every nerve in the body quivering with pain. Headaches, backaches, torturing bearing down pains and dragging sensations make women nervous and hysterical.
Dear Mrs. Pinkham: — I was troubled for eight years with irregularities which broke down my system and brought on extreme nervousness and hysteria. I could neither enjoy my meals nor sleep nights, became easily irritated and nervous and very despondent. Lydia E. Pinkham's Vegetable Compound proved to be the only medicine which helped me. After taking the third bottle, my general health began to improve. At the end of the fifth month I was well and could attend to my household and social duties and enjoy life. Mrs. Chester Curry, 42 Saratoga Street, East Boston, Mass.
Mrs. Curry, whose portrait appears on the right, is the leader of the Ladies' Symphony Orchestra. The following letter is from Miss Goode, President of the Bryn Mawr Lawn Tennis Club of Chicago:
Dear Mrs. Pinkham: — I tried many different remedies to try to build up my system, which had become run down from loss of proper rest and unseasonable hours, but nothing seemed to help me. Mother is a great advocate of Lydia Pinkham's Vegetable Compound for female troubles, having used it herself some years ago with great success. So I began to take it, and in less than a month I was able to be out of bed and out of doors, and in three months I was entirely well. Really I have never felt so strong and well as I have since. Miss Cora Goode, 355 E. Chicago Ave., Chicago, Ill.
Mrs. Pinkham's advice is free to all. Her address is Lynn, Mass.
Lydia E. Pinkham's Vegetable Compound Cures Where Others Fail

This typically melodramatic ad made an appeal to suffering women's natural desire to escape the surgeon's knife.

diffident assertion that it was "Recommended as a Vegetable Tonic in Conditions for Which this Preparation Is Adapted," whatever that might mean. Citing its 18 percent alcohol content, a fact that had never troubled the teetotaling Lydia, one journalist derided the compound as nothing more than "cheap whisky." The alcohol percentage was subsequently cut to 15 to avoid having the compound taxed as a beverage.

But none of this diminished the ardent loyalty of the compound's faithful users—and perhaps their daughters as well. Sales reached an all-time high of more than $3 million in 1925. Business gradually declined after that, although the fame of Lydia's potion had spread so far and wide that an Army chaplain found a bottle in the possession of a South Pacific villager during World War II. The Pinkham heirs finally sold the firm in 1968 to a large pharmaceutical company. The manufacturing operation was moved to Puerto Rico five years later, where the remedy is still

being produced and bottled today.

What was Lydia's secret? In her definitive book on Lydia Pinkham, *Female Complaints*, historian and University of California professor Sarah Stage says that timing had a great deal to do with it. "Lydia Pinkham began selling her Vegetable Compound," Stage points out, "in an era marked by medical controversy, public dissatisfaction with doctors, and an obsessive concern with women's weaknesses—a climate ideally suited to promote the success of the Pinkham venture."

There may have been more to it than that, however. In the 1940s, scientists found traces of materials with estrogenlike activity in some of the compound's original ingredients. Theoretically, those materials might —if present in sufficient quantities and in an orally effective form—have had some therapeutic value. There is another possibility. Several of the compound's components appear to have had diuretic properties which might have helped relieve some of the symptoms of what is now called premenstrual syndrome, or PMS.

So maybe Lydia was right all along —maybe the stuff really did work. There is no question that millions of women thought it did, even if the relief it provided was as much psychological as physical. Perhaps it wasn't the chemistry of the compound that mattered, but the human chemistry between Lydia and the women who trusted her.

Pinkham memorabilia from collection of Smithsonian Institution include herbal tonic, a "Directions" booklet and a letter of advice to a customer.

"I smile to myself whenever..."

. . . the ladies at the club admire my Anne Klein sweater jacket.

. . . dinner guests remark that my mahogany wine table is as rare a find as the vintage I'm serving.

. . . I think of my husband opening one of his Christmas presents saying, "Two cashmere sweaters!"

. . . my mother-in-law snips, "How *do* you afford all those designer clothes?"

. . . anyone opens a birthday gift, finds a more-lavish-than-expected present . . . smiles at me and says, "You shouldn't have."

Because I *didn't*. I'm smiling to myself because I saved up to 70% on everything in the GRAND FINALE catalog. So can you. Just mail the coupon and they'll send you catalogs almost every month with thousands of dollars in savings on famous names — from furnishings to fashions. All guaranteed. *And* they take credit cards. Why not mail the coupon now? Then, if I ever see you suppressing the barest shimmer of a smile, I'll know why.

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Book reviews

Americans in Paris: An Anecdotal Street Guide
Brian N. Morton
Olivia & Hill Press, $27.50/$14.95 paper

What did Archibald MacLeish, Robert Fulton and James McNeill Whistler have in common? They all lodged, at one time or another, in the Rue du Bac. Who preferred the nearby Rue Jacob? Washington Irving, Benjamin Franklin, Sherwood Anderson and James Baldwin. Where did James Fenimore Cooper meet Walter Scott? On the staircase of the Hotel Jumilhac, a convent converted into apartments still very much in use today.

These and a thousand other things we need to know are packed into Brian N. Morton's *Americans in Paris: An Anecdotal Street Guide*, a splendidly annotated address book celebrating our love affair with the French capital from 1776 to the present. A delightful idea in subject and presentation, the volume is thoroughly cross-indexed. You can read alphabetically by street or you can jump around by personality or arrondissement. Seven maps designed for walking tours or armchair fantasizing are another plus.

Silas Deane of Connecticut arrived in Paris on July 5, 1776, and thus became the first official American citizen to enter the city's gates. He was followed by no less than Thomas Jefferson, John Paul Jones, Margaret Fuller, Louisa May Alcott, Thomas Eakins, Thomas Edison, Alexander Calder, Art Buchwald, Duke Ellington and the servicemen of two World Wars. Time and again, Americans discovered that Paris was a state of mind. In 1876 the Paris correspondent of the *New York Tribune* explained that there "everything is accepted and understood. Paris itself is a sort of painted background which keeps shifting and changing, and which is always there, to be looked at when you please, and to be most easily and comfortably ignored when you don't." The reporter was Henry James.

Morton devotes the most space to the usual luminaries: Gertrude and Alice, Scott and Zelda, Ernest and Hadley, Ernest and Scott, Ernest and Gertrude, Ernest and Ernest. Too many pages rehash what are now thrice-told tales of Lost Generation antics. Fortunately, this is counterpointed with a rewarding wealth of material on Americans unsuspectedly at home in Paris. Yankee Emerson was an avid cafégoer who observed, "What a luxury it is to have a cheap wine for the national beverage." Sinclair Lewis began *Elmer Gantry* at the Bristol Hotel. Samuel Morse experimented with a model telegraph in his rooms in the Rue des Mathurins.

In a book like this, anyone can spot some rather careless omissions. My list includes Berenice Abbott, Malcolm Cowley, Peggy Guggenheim and Edward Hopper. But with its accounts and whereabouts of more than 350 Americans who lived and worked and diverted themselves in the City of Light, *Americans in Paris* seems destined to become a cheerful addition to the flight bag—it will certainly be indispensable for settling arguments.

Buster Keaton deadpans camera in Paris, about 1950. He wowed audiences there.

Brian Morton, who teaches French literature at the University of Michigan, Ann Arbor, is following this volume with *Americans in London* and *Americans in Italy*. I look forward to reading them.

Avis Berman
New York writer on the arts

The Audubon Society Field Guides to the Natural Places of America (4 vols.)
The Mid-Atlantic States: Coastal; The Mid-Atlantic States: Inland; The Northeast: Coastal; The Northeast: Inland
Pantheon, $9.95 each

The world is not sorely lacking for guidebooks to nature. Under the tutelage of those now in print, one can learn to negotiate Himalayan ice fields, identify mammals by their droppings and tell a coot from a rail. Indeed, there are so many avian field guides on the market that one can pick and choose among rival methods for coot-rail differentiation.

To survive in what has become a highly competitive arena, a new guidebook should behave something like a species: it should fill the bookish equivalent of an ecological niche. By that I mean finding not only physical space on the shelf but also room for distinction. The book should either outshine existing guides or break new ground.

The new Audubon series of field guides is a success of the ground-breaking variety. *The Audubon Society Field Guide to the Natural Places of the Mid-Atlantic States: Inland*—to give one volume its full, jaw-taxing title—insinuates itself between such sweeping and personal approaches as Charlton Ogburn's *The Southern Appalachians* and what might be called the special-interest guides (birds, butterflies, wilderness trails and so on).

Each volume serves up both introductory essays on the major ecological provinces that it embraces ("The Piedmont: The Foot of the Mountains," "The Appalachian Plateau: A Furrowed Upland") and map-keyed descriptions of specific sites (Nummy's Island, Giant Ledge, Hawk Mountain Sanctuary). The site descriptions explain geological formations, encapsulate relevant human history, and list and depict selected flora and fauna likely to be encountered.

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THE ONE TO WATCH

Instead of lugging around one field guide per taxon, the traveler can now make an informed trip with the aid of a single, pocketable book, needing to change volumes only when moving from one region to another.

Where appropriate, the site treatments extend beyond the locale at hand. Thus, in the *Mid-Atlantic States: Coastal* volume, the entry on Assateague Island contains a far-ranging disquisition on the hue of sand: glittering along the Mid-Atlantic coast, blinding white in Florida and the Caribbean.

Elsewhere, a highly condensed discussion may suffice, as in the four-sentence entry on the Wye Oak, a massive tree on Maryland's Eastern Shore that is now in its fifth century of life.

This eclecticism has its drawbacks, however, which seem to be compounded by the diverse authorship of the volumes. One book mentions George Washington's entrepreneurial involvement in the Patowmack Canal, but another omits his speculation in the Great Dismal Swamp, where a canal still bears his surname. And by what process did the authors of the *Mid-Atlantic: Inland* volume decide to cover the Dolly Sods wilderness but not the nearby and equally alluring Cranberry Wilderness? There is also some careless writing. One essay speaks of mountain streams where "fish and other water-loving creatures thrived." One might as well call humans air-loving creatures.

Yet, if not minor, these shortcomings are outweighed by the volumes' thoroughness and utility. No other available series can match the Audubon combination of the general and the particular. Carrying one of these books on a day-hike will be the next best thing to having an expert naturalist always at your side.

Dennis Drabelle
Washington writer and
amateur naturalist

Colette
Joanna Richardson
Franklin Watts, $17.95

A series of snapshots illustrates this book: the first, a portrait of Colette at five, seated primly at the edge of a tufted chair, gazing solemnly into the camera; the last, the celebrated writer at 80, frizzed hair haloing her face, kohl-lined lids lowered, slumping in a wheelchair. In between we see her three husbands; "Missy," her lesbian lover; Colette's stepson Bertrand de Jouvenel, an adolescent when they began their long affair; "Bel Gazou," the daughter Colette often ignored. We see Colette at a writing table, looking oppressed, as she was, by her domineering husband, Willy. We see her posing as her fictional character Claudine, the quintessential French schoolgirl, whose free-wheeling adventures captured the imagination of turn-of-the-century Parisians. We see her draped in leopard skin, half nude, in a publicity photograph as a "pretty actress." She was more than pretty: she exuded a mystery that makes her, even now, elusive.

Joanna Richardson, Francophile and biographer of Verlaine, Gautier and Zola, presents Colette's life through an assemblage of vignettes—verbal snapshots that follow her flamboyant career, her dreams and desires, her energetic and unconventional love affairs. The result is a cool and dispassionate portrait of a sensual and passionate woman.

Sidonie-Gabrielle Colette arrived in Paris in 1893, when she was 20, on the arm of her worldly, debonair husband, Henry Gauthier-Villars, known to all Paris—and all Paris did seem to know him—as Willy. The innocent young girl from Burgundy was at first shocked at Willy's decadent life. But soon she became fascinated by the artists, composers and writers she met—Debussy, Ravel, Gide, Cocteau—and they were equally taken by the "extraordinary woman, with her incendiary eyes." She began to write, but not from inspiration. Instead, Willy hoped her efforts would earn some money to "help pay" his pretended debts.

In 1900 he published *Claudine à l'école* under his own name. The book was so successful that the enterprising Willy locked his wife in their apartment under orders to continue writing. She did, and a series of Claudine novels gained increasing popularity. Soon there were Claudine clothes, perfumes, even ice cream; and Willy became a noted novelist. Then, in 1904, Colette published *Dialogues de Bêtes*, her first book under her own name, and proclaimed herself a writer.

In 1905, she separated from her husband. In 1906, she began an affair with a notorious lesbian, the Marquise de Belboeuf, the motherly and protective Missy. That year marked the beginning of her emancipation from her past—both her innocent childhood in the countryside and her bondage to her husband.

Her novels—including *Chéri, Gigi, La Vagabonde*—reflect a woman unfettered by society's sense of morality, able to indulge in whatever pleasures she desires. They offer a portrait not only of a singular sensibility, but of a particular period in our social history, an age of sometimes-turbulent transition for women.

Colette celebrated beauty and sensuality. She loved life, and her spirit seemed eternally young. "Of course I'm not 80," she told a friend. "I am 20 years old, four times over." She had loved freely and received love in return. She was adored in France, made a Grand Officer of the Legion of Honor and given a state funeral, the first for a woman. Yet despite her indomitable spirit, despite the grand passion in her life, she seemed to harbor a certain sadness, what one critic called "a fugue in a minor key." Cocteau was a close friend, and yet he admitted, "She is alone. Alone she was. Alone she remains."

Linda Simon
Author of books on Gertrude Stein and
Thornton Wilder

A Not-So-Still Life
Jimmy Ernst
St. Martin's/Marek, $14.95

Last February 6, Jimmy Ernst had just hung his first New York exhibition in some few years, was satisfied with the hanging and went around the corner to a radio interview. He had barely arrived in the studio when he suffered a massive heart attack. He was pronounced dead at the hospital. In its tragic way, his death at such a moment was in keeping with the events, the times and the people brilliantly chronicled in this compassionate, penetrating memoir of life among the Surrealists, published at almost the moment of the author's death.

"There is a child among you, taking notes." That describes Jimmy Ernst among the Surrealists—including his father, Max—in the years of his growing up. The result is a devastating, truly underworld look at an upperworld that regarded itself as an underworld. Max Ernst was a founder of Dada, which, in Jimmy's earliest years—the early 1920s—was transforming itself into Surrealism.

Besides being an endlessly inventive fantasizer, Max was also an endlessly indefatigable womanizer. In addition to the

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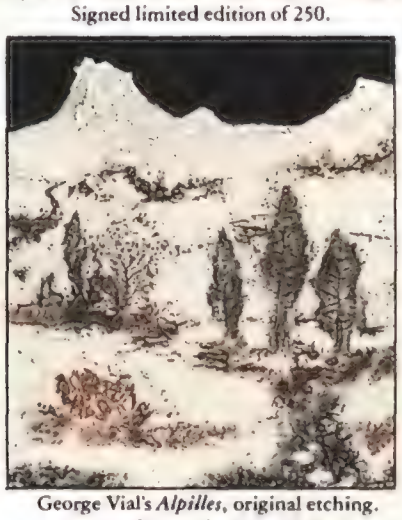

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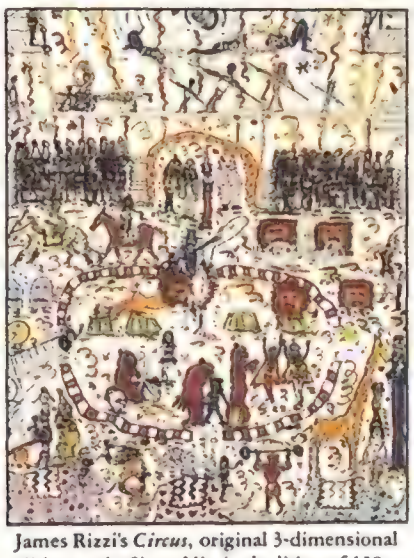

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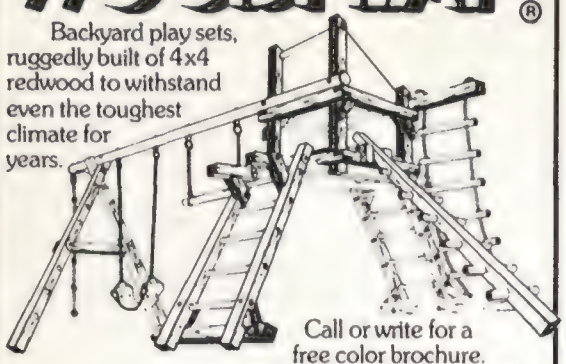
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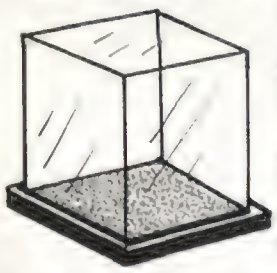
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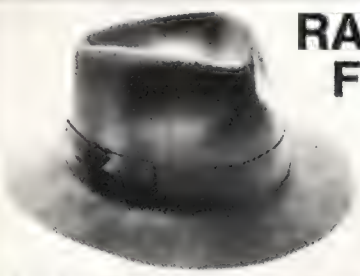
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obvious blight this visited upon Jimmy's childhood, it also forced the boy, both in Paris and later in New York, to become in some sense the guardian of his father. As we watch Jimmy grappling with the problems of parental promiscuity, from Max's abandonment of his wife (Jimmy's mother, the art historian Louise Straus-Ernst) for Gala Eluard (who later became Mrs. Salvador Dali) to the tragicomic ménage of Max and Peggy Guggenheim and a steady stream of pass-through "visitors," we realize—as Jimmy did not at the time—that in important respects, the child was becoming father to the man.

That reversal of roles became complete after Jimmy, thanks to his early infatuation with America and what he learned from adults about the immediate European future, broke through bureaucratic tangles and got himself to the United States. When Max found himself desperate to come here, too, the immigration official was persuaded only by the willingness and ability of a blood relative, son Jimmy, to guarantee Max's support.

The book will be basic reading for anyone interested in Surrealism in Europe, and especially in the strange passing of the torch that occurred from the Surrealist exiles in New York to the new generation of Americans who would become the Abstract Expressionists. Peggy Guggenheim was the presiding genius at the meeting. Jimmy Ernst, besides being a member of the group of younger artists, was also the "mayor of the palace" of Guggenheim's establishment. He assembled the first catalog of her collection, made peace between drunken warrior-artists and maintained relations between the king and the queen—Max and Peggy—all the while watching the futility of Peggy's hopes for happiness with Max.

All of these art-history notes are fascinating and valuable, but the real story of the book, never overtly presented by the author, is that of the reconciliation of a patient, persistently loving son with a father who was at worst a scoundrel, at best merely heroically irresponsible, but who was, nevertheless, a genius.

The complementary story is that of the son's discovery of the details of his mother's death in Auschwitz. Those two enormous filial burdens are taken up, dealt with and finally accepted before our eyes. The book is beautifully written, with modesty at every point, quiet wit always present, and the saintly combination of detachment and burning love.

In Jimmy Ernst, we have all lost a great deal more than an American painter of the first rank.

Frank Getlein
Washington critic and author

Mind and Media: The Effects of Television, Video Games, and Computers
Patricia Marks Greenfield
Harvard University Press, $4.95

Television is one of the great mysteries of American life. We spend a tremendous amount of time watching it, yet we know almost nothing about how it influences our lives. The amount of time devoted to television watching in the average household has increased steadily since the device was first introduced around 1950. Currently, 98 percent of all households contain a television set that is "on" for about seven hours each day. Children from two to 12 and adults from 18 to 55 watch an average of three to four hours a day. Teenagers (13 to 17) watch somewhat less, and older individuals, over 55 years of age, watch somewhat more than the average. What impact does all this television watching have?

Many people think that TV watching is slightly naughty, something one shouldn't admit to doing, but they don't know why. People also know that research has associated it with acting violently. Maybe it even *causes* some people to be violent. But what else is there to know about it? It's a mystery.

In her new book, *Mind and Media*, Patricia Greenfield begins to shed light on the mystery by describing a variety of fascinating new studies about television. Professor Greenfield does this in a readable fashion, while at the same time discussing the implications of this research for both child rearing and education; the book is optimistic.

Watching TV has a powerful influence on what we think and how we think. It requires a set of skills, "information processing skills," different from those needed to read a book or listen to the radio. The "form" of television is unique, and the cognitive skills needed to comprehend it must be learned. When children acquire these skills, many of which are detailed in the first part of the book, they become "television literate." Before such literacy develops, however, children may

misunderstand and be misled—influenced in unintended and undesirable ways.

Television also partly determines what we think about. There is now substantial evidence that it has a powerful effect on our views of social reality. All television is educational, as Nicholas Johnson (a former commissioner of the FCC) once said. The only question is, What does it teach? Greenfield explains that TV teaches us most about things that we understand the least. It gives us stereotypical views about sex roles, minorities and people in distant lands.

But these findings raise an important question: If children learn from television, if they imitate the bad things, the violence and the stereotypes, then might they not, as well, imitate pro-social images and accurate portrayals of other people? Yes, says the author, this is possible. TV could be used intelligently in education, if it is used selectively and in combination with other media. Each medium of expression—print, radio, television, video games and computers—has its own thing to teach us because each is different in the cognitive demands it makes upon us. Each medium, to be used, requires different cognitive skills.

On the whole, this is a worthwhile book containing important new information about TV and interesting speculations about the roles of different media in education. Its only weakness is that it doesn't go into enough detail. It doesn't tell the whole story. It moves so quickly over such a lot of research that while it describes the forest, it doesn't provide enough detail about the trees. It is difficult to do both, and Greenfield deserves credit for doing the one thing—broad description—extremely well.

Read this book to learn about the wealth of new research on television (there is not as much on video games and computers). And when you've finished, recall the story told about Red Skelton when he was traveling to Europe on an ocean liner. A passenger came up to the famous comedian and remarked: "Look at all that water! I didn't know there was so much. As far as the eye can see, more water than I ever thought existed!" "Yes," replied Skelton, "and remember—that's just what's on the surface!"

John C. Condry
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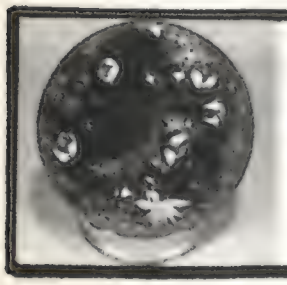

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Additional reading

Safecracking (p. 34)

Game of Thieves by Robert R. Rosberg, Everest House, 1981

"I Was King of the Safecrackers" by Herbert Emerson Wilson, *Collier's* (5-part series), May 21, 28, June 4, 11, 18, 1949

Silent Sentinels: The Story of Locks, Vaults, and Burglar Alarms by Robert Kraske, Doubleday, 1969

"Safes and Safe-Breakers—The Present Status of the War Between Safe Builder and Craftsman" by Edward H. Smith, *Scientific American* (2-part series), October, November 1922

Statue of Liberty (p. 46)

The Statue of Liberty by Marvin Trachtenberg, Penguin Books, 1977

True Light on the Statue of Liberty and its Creator by André Gschaedler, Livingston Publishing Company (Narberth, Pennsylvania), 1966

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"Statue of Liberty," report for French-American Committee for Restoration of the Statue of Liberty, Inc. (Washington, D.C.), 1983

Jean-Antoine Watteau (p. 58)

Watteau: 1684-1721 by Margaret Morgan Grasselli and Pierre Rosenberg (exhibition catalog), National Gallery of Art, 1984

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Monticello: A Guidebook by Frederick D. Nichols & James A. Bear jr., Thomas Jefferson Memorial Foundation, 1982

"Jefferson's Garden Reborn" by Anne Schwartz, *Garden*, November-December 1982

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Superconductivity (p. 78)

"The Superconducting Computer" by Juri Matisoo, *Scientific American*, May 1980

"Superconductors in Electric-Power Technology" by Theodore H. Geballe and J. K. Hulm, *Scientific American*, November 1980

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Magnetic Levitation for Rail Transport by R. G. Rhodes and B. E. Mulhall, Oxford University Press, 1981

Babar (p. 90)

Babar's Anniversary Album: Six Favorite Stories by Jean and Laurent de Brunhoff, Random House, 1981

Fifty Years of Babar by Laurent de Brunhoff (exhibition catalog), International Exhibitions Foundation (Washington, D.C.), 1983

Pogo ants (p. 99)

The Ant Realm by Ross E. Hutchins, Dodd, Mead, 1967

The Dinosaur Hunters by Robert Plate, David McKay, 1964

The Dawnseekers by Robert West Howard, Harcourt Brace Jovanovich, 1975

Lydia Pinkham (p. 107)

Female Complaints by Sarah Stage, Norton, 1979

Lydia Pinkham Is Her Name by Jean Burton, Farrar, Straus, 1949

The Life and Times of Lydia E. Pinkham by Robert Collyer Washburn, Putnam's, 1931

Nostrums and Quackery by Arthur J. Cramp (3 vols.), Press of the American Medical Association (Chicago), 1911, 1921, 1936

The Golden Age of Quackery by Stewart Holbrook, Macmillan, 1959

Smithsonian highlights

The Fourth of July weekend will be filled with activities on the Mall as the Festival of American Folklife winds up its annual celebration. Philadelphia blues music, Aleut craftsmen and plays by senior citizens will be among the special performances and demonstrations.

Special July exhibits and events

National Museum of Natural History
Photographic Portraits of North American Indians: a Re-creation of the First Photographic Exhibition in the Smithsonian Institution (through December).
Exploring Microspace (through July 15).

National Portrait Gallery
The Man from Indiana: Booth Tarkington, 1869-1946 (July 6-December 16) Memorabilia highlight NPG's portrait.

National Museum of American Art
Fantasy and Imagination: Sculpture by Eugenie Gershoy (July 27-January 1985).
Erastus Salisbury Field: 1805-1900 (through September 4).

Anacostia Neighborhood Museum
Black Wings (through August 5) Exhibit tells story of black American aviators.

National Museum of African Art
African Mankala (through October 7) Exhibit of game boards.

Cooper-Hewitt Museum (New York)
Manhattan Skyline: New York Skyscrapers Between the Wars (through September 23).

Hirshhorn Museum & Sculpture Garden
Artistic Collaboration in the 20th Century (through August 19).

National Museum of American History
Southeastern Potteries (through August 15) More than 100 objects, photographs.

In *Black Wings* at Anacostia Museum: 1920s stunt pilot Bessie Coleman.

National Air and Space Museum
Apollo 11: 15 Years Later (July 20; all day) Celebration includes symposium, discussion with four former astronauts, and a Lunar Landing Party (an evening open house for the public).
Shooting the Moon (and Other Celestial Subjects) (July 7; 9 A.M.) Sky lecture.

Freer Gallery of Art
James McNeill Whistler at the Freer Gallery of Art (through December 1).

Exhibition catalogs

Catalogs available at this time include:
Exposed and Developed: Photography Sponsored by the NEA (paper; $10)
Ethiopia: The Christian Art of an African Nation (paper; $5.95)
Erastus Salisbury Field (paper; $18)
Artistic Collaboration in the Twentieth Century (cloth; $40)

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Smithsonian Galaxy: Short radio features.
Here at the Smithsonian. . . : Two-minute TV features look at James McNeill Whistler and new NASM gallery.
Smithsonian World: hour-long TV special on PBS, July 2, "Crossing the Distance," is part of series on the Smithsonian.

To find out what stations in your area carry these programs, write: Office of Telecommunications, C222B, Smithsonian, Washington, D.C. 20560.

Resident Associate events

To become a Resident Associate, or to find out about the many other activities presented monthly, or for fee and ticket information, call 357-3030. Here are some July events:
Summer Camp Program (July-August) Special sessions on dinosaurs, creating books, drama, and keeping summer nature diaries are held for children ages four to 15. Call for full schedule.
'Give 'Em Hell, Harry': A Video Portrait (July 11; 8 P.M.) Impersonation of Harry Truman by James Whitmore.
Stonehenge of the Hebrides (July 16; 8 P.M.) Slide-illustrated lecture.
David and Dorothy 'On Broadway' (July 20; 8 P.M.) Musical revue.
Exploring the Amazon (July 26; 8 P.M.) Lecture by explorer Mark London.

Smithsonian Institution Traveling Exhibition Service

SITES circulates exhibitions to hundreds of cities outside Washington. To sponsor a show in your community, write: SITES, Smithsonian, Washington, D.C. 20560. Here are some July exhibits:
Pensacola, Florida (June 23-July 22) *The Magic of Neon*, Cordova Mall (see *Highlights continued*, p. 128).
San Jose, California (June 30-July 29) *A Collector's Eye: The Olga Hirshhorn Collection*, San Jose Museum of Art.
Detroit (June 30-July 29) *Black Wings: The American Black in Aviation*, Afro-American Museum of Detroit.

Membership benefits when visiting the Smithsonian

To help you decide which treasure-filled area of the Smithsonian to visit, highlights of the 13 museums and the Zoo are described in a daily slide/lecture orientation. Details about this and other membership benefits, including discounts in Smithsonian shops and dining in the Court, are available 10 A.M. to 4 P.M. daily at the reception desk in the castle.

Request a free previsit packet by postcard or phone: Associates' Reception Center, Smithsonian, Washington, D.C. 20560, (202) 357-2600; for hearing impaired, TDD (202) 357-1729.

Highlights continued

Nostalgia for neon signs

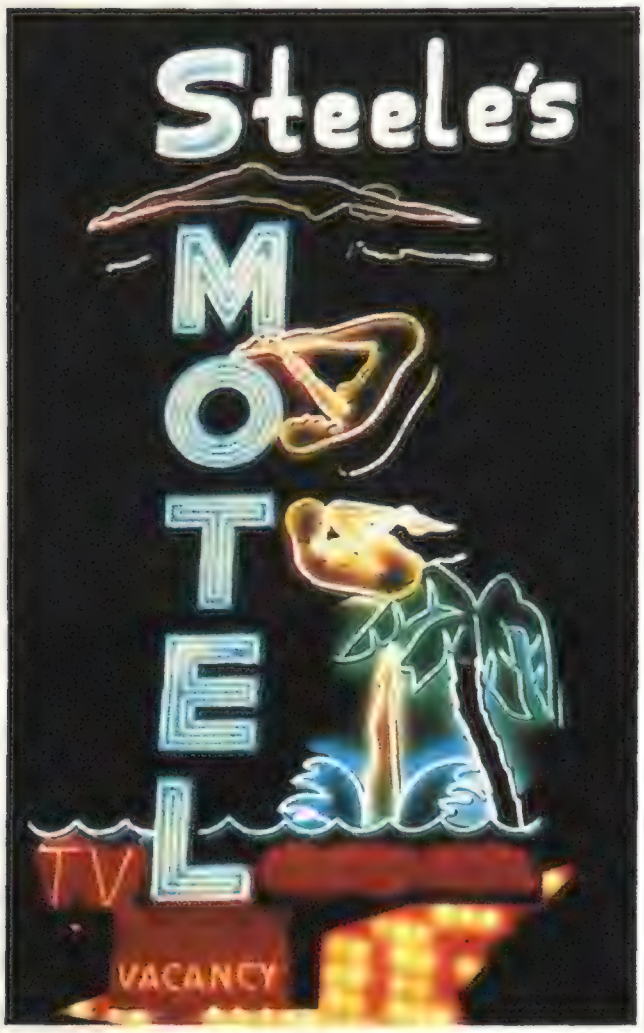
In 1923, Earl C. Anthony returned from Paris with a purchase. He had bought two neon signs—the first to be brought into this country—which he installed over his Packard showroom in Los Angeles. For days afterward, traffic along that stretch slowed to a crawl.

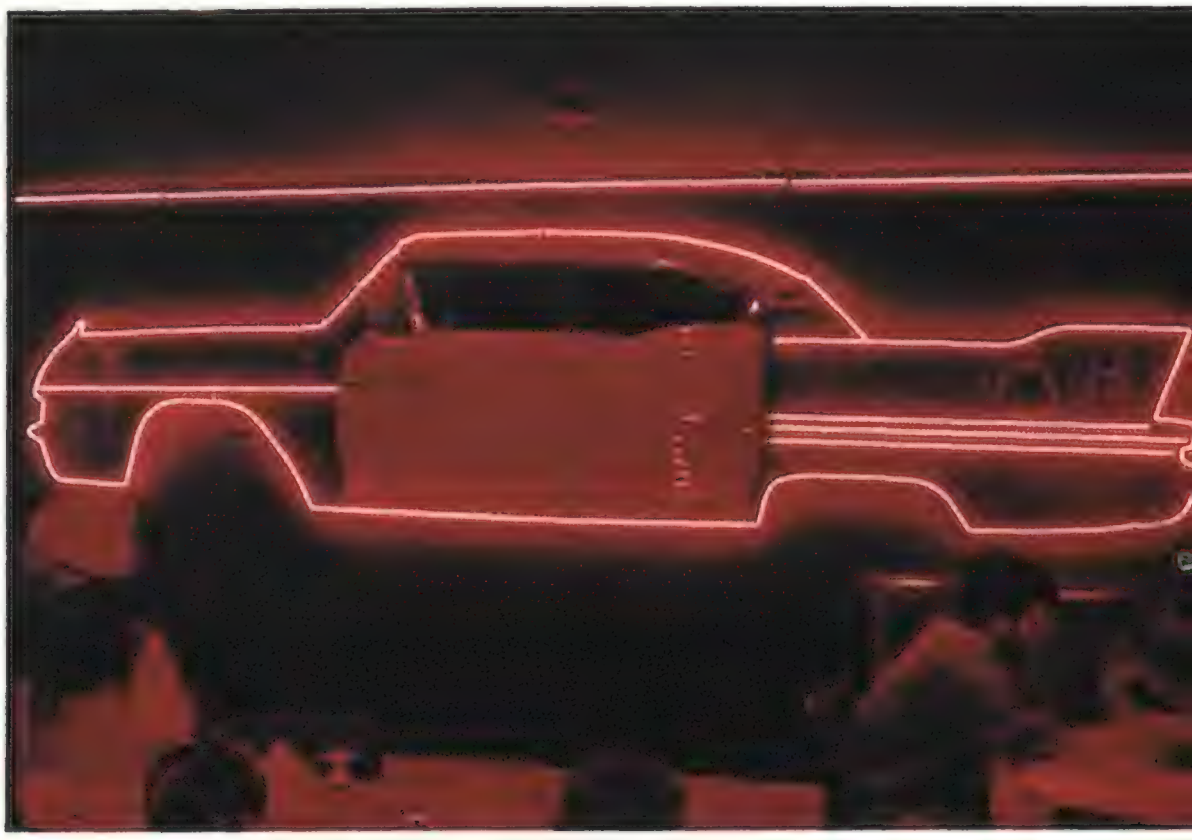
The love affair with neon had begun, and its heyday was to last through the Forties. Nearly everyone who is old enough remembers a favorite sign from those years. For New Yorkers heading out of the city into New Jersey, it might have been an eternally galloping horse; while Southern Californians witnessed the world's longest-running case of leaky faucet (below). The magic never dimmed.

Today, nostalgia for neon's flashy, friendly light is making it popular once again, as craftsmen create new designs for the street or, often, to hang in galleries. Workshops have sprung up coast-to-coast with names like Let There Be Neon (New York City), Dr. Neon (Texas) and Planet Neon (Michigan).

You can see a sampling of the old, and the new, in "The Magic of Neon," a SITES traveling exhibition organized by Michael Webb. Its 30 Cibachrome prints are on view this month at the Cordova Mall in Pensacola, Florida. Or, if you're lucky, you can find some dandy examples in your own hometown. If they're there, you can't miss them.

Constance Bond



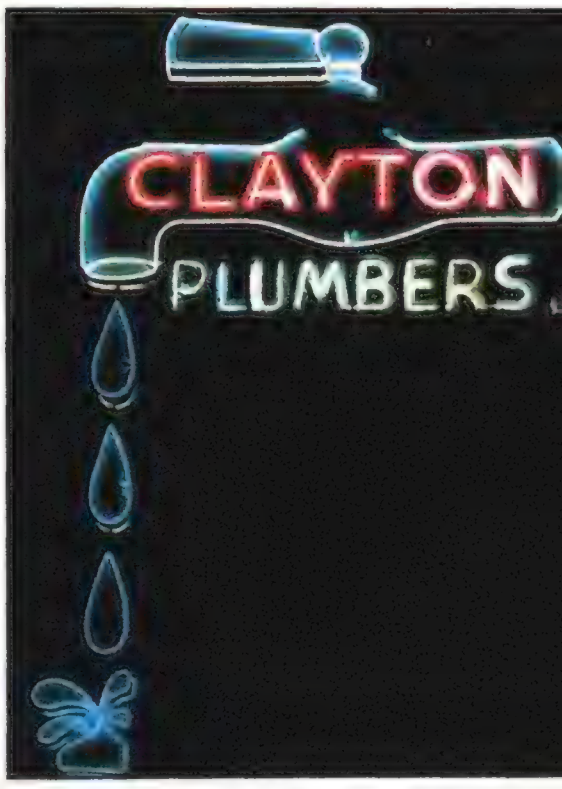


At Fat City, a San Diego restaurant, light frames a 1958 pink Cadillac.

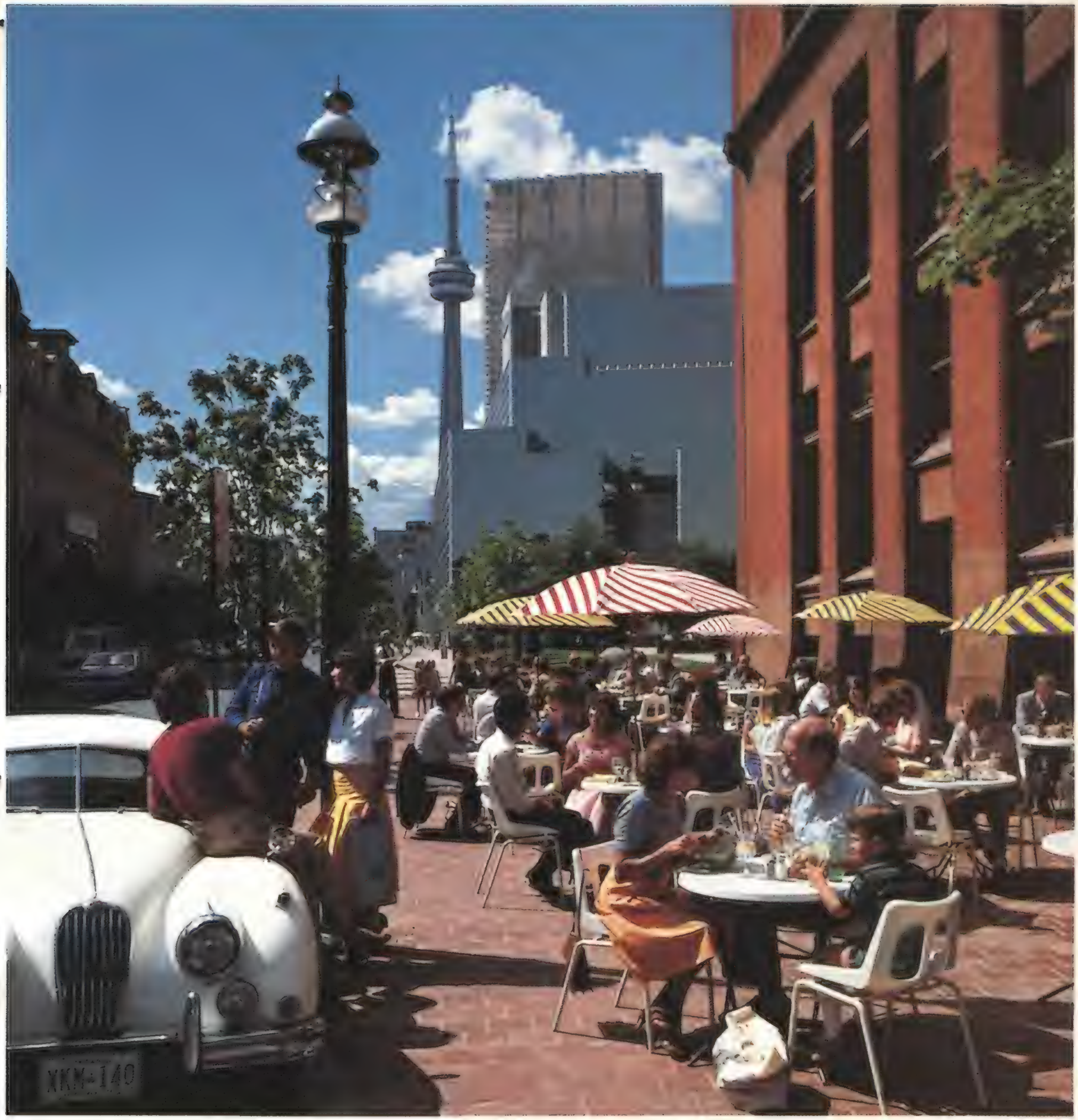
Bather never misses her perfect dive in 1950 sign, Van Nuys, California.

Canter's Bakery in Los Angeles put up jolly worker bearing loaves in 1951.

Los Angeles' Chinatown boasted early neon landmark, Golden Pagoda, 1938.



Animated classic from 1947, in West Los Angeles, has a dripping faucet.



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Coming in November: Tour of Los Angeles art and architecture.

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Baja California Adventure December 21-30: Sail on the *Don Jose* to explore southern islands in the Sea of Cortez.

Christmas in Austria December 21-January 3: Enjoy the many cultural attractions of Salzburg and Vienna during the height of the holiday season.

Christmas in Canterbury December 22-January 3: An old-fashioned Dickens Yuletide: services at Becket's cathedral, and traditional foods and festivities.

Write National Associates, A&I 1278 Smithsonian Institution, Washington, D.C. 20560 or call (202) 357-2477 for specific tour brochures

in Washington

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History of American Architecture September 30-October 5: Experts focus on the diversity of styles and the many gifted architects who have created a unique tradition of great beauty and importance. Includes an all-day trip to Frank Lloyd Wright's romantic Fallingwater, one of the most famous American houses of the 20th century.

Digging Up Rome October 14-19: Well-known authorities on the art, architecture and fauna of the classical world use archaeological finds, eyewitness accounts and numerous slides and films to examine the art and daily life of this vibrant city at the time when all roads led there.

Aircraft Restoration: How To October 21-25: The master craftsmen of the National Air and Space Museum share their many techniques in workshops at the Paul E. Garber Facility (Silver Hill, Maryland).

Genealogical Research October 21-26: Taught by Milton Rubincam, Marilyn Duncan and other authorities, participants learn how to conduct research in major genealogical repositories.

Connoisseurship of Chinese Art November 4-9: Expert Shirley H. Ganse lectures on fine Chinese decorative arts and paintings in private and public collections, developing an eye for the best in terms of style and technique and detection of copies and forgeries. Includes private guided tour before public hours of the acclaimed exhibition, "Treasures from the Shanghai Museum—6,000 Years of Chinese Art," featuring hundreds of objects never before seen in the United States.

Golden Age of the Aztecs November 11-16: Masterpieces of art and architecture, recent excavations and surviving manuscripts and chronicles are featured in well-illustrated lectures on the brilliant culture of the great empire builders of the ancient Mexican world.

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By Melvin Maddocks

Milkman's serenade: some reflections upon being early to rise

It's early in the morning—very early. We're talking about the darkness before the dawn. We're talking about the morning star dancing, and suburban lawns laid out like black velvet, and your neighbor's dog still whimpering into his whiskers on the porch as he dreams of the last fight he lost. We're talking about 4:30—maybe even 4—A.M.

Why, when sane people are sleeping (including other members of the family), do we early risers feel compelled to haul our bodies out of bed, shuffle into slippers and (tailgated by an overweight cat) flip-flop downstairs to orange juice, black coffee and untimely life?

The usual answer—biological time clock—is the sort of nonsense that's passed off by late risers. Late risers share a mistaken suspicion that early risers are a pushy lot: insomniacs like Napoleon Bonaparte and Frederick the Great, stealing a ruthless march on a sleeping world of innocent snorers. Ambitious Benjamin Franklin, who rose anytime from 5 to 6, knew that "The early bird catches the worm"—a remark that leaves late risers squirming. But the truth is that early risers, except for their early rising, are fairly passive sorts, quite at a loss to explain their one little perversity.

I cannot even remember when I began this practice of settling down to the kitchen table, the general headquarters of the early riser, with the cat staring back at me, front paws tucked under—both of us wondering why we are here, both of us into our rituals.

Sometimes I spend a few minutes clipping coupons from last Sunday's papers.

Sometimes I pay bills.

Sometimes I make a list on a small blue pad of the important things I'm going to accomplish after the day begins.

Sometimes I read poetry from an old college anthology, with the gold lettering worn from its cover.

Sometimes I write a letter to a friend. Early rising brings out the best in a letter writer. I become bold and indiscreet, recording confidences in slashing strokes with a broad-nibbed pen. Sitting in the pool of light in the breakfast nook, I feel like a speck in infinite space. I can say anything, and I do—almost—then seal the envelope before daylight sets in and makes me circumspect.

But the point is, any activity is arbitrary, as all early risers know. Whatever else I am doing, I am waiting. The window sash above the sink creaks like an omen in the late-night wind. The coffee percolates as if sending a secret code. In this strange border country of time where even familiar objects become just a little odd—including oneself—I seem to have made a previous appointment. But for what purpose? And with whom?

We wait, the cat and I.

When the silence becomes deafening, I turn on the radio. Larry King and the all-night talk show are for people who can't find a way to end yesterday. Early risers need a beat. I listen to jazz. The great tenor saxophones—Coleman Hawkins, Ben Webster and Lester Young—sound like train whistles in the night. Early risers sing along, and sometimes even dance along—clowns in baggy pajamas, swaying under a fluorescent light.

On the kitchen table my grandfather's gold watch ticks. When it's six o'clock by the Roman-numeral face, the world begins to belong to others—the late early risers. Somewhere, yawning monks are singing Gregorian chants; I listen to Billie Holiday and read George Seferis: "Grant us, outside of sleep, serenity."

Is this the morning prayer of all early risers? Amen. So be it.

The cat stands and stretches—first forward, then back—shivers her tail and looks me in the eye. She, at least, is ready to start the day. I follow her to the door with my second (or third) mug of coffee in hand. One star still flickers in the brightening sky, but there are no other kitchen lights on the street to keep it company.

We waited, the cat and I, and whatever we were waiting for never happened. But this is not the end. There's another early morning tomorrow—depend on it.

This is the hour when, as a child, I ran to my bedroom window upon hearing the clip-clop of the milkman driving one of the last of the horse-drawn wagons up our street. The milkman perched on his seat in the morning twilight, ramrod straight and dim as a ghost—made real by his clucks and low whistles and whoas and the clink of his bottles. Real bottles. It was a great private moment. Nobody in the world existed except the milkman, his horse and me. The feeling was so pleasurable that for at least a year I was determined to become a milkman when I grew up.

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